91D Operating Room Branch

WELCOME

BASIC LIFE SUPPORT COURSE

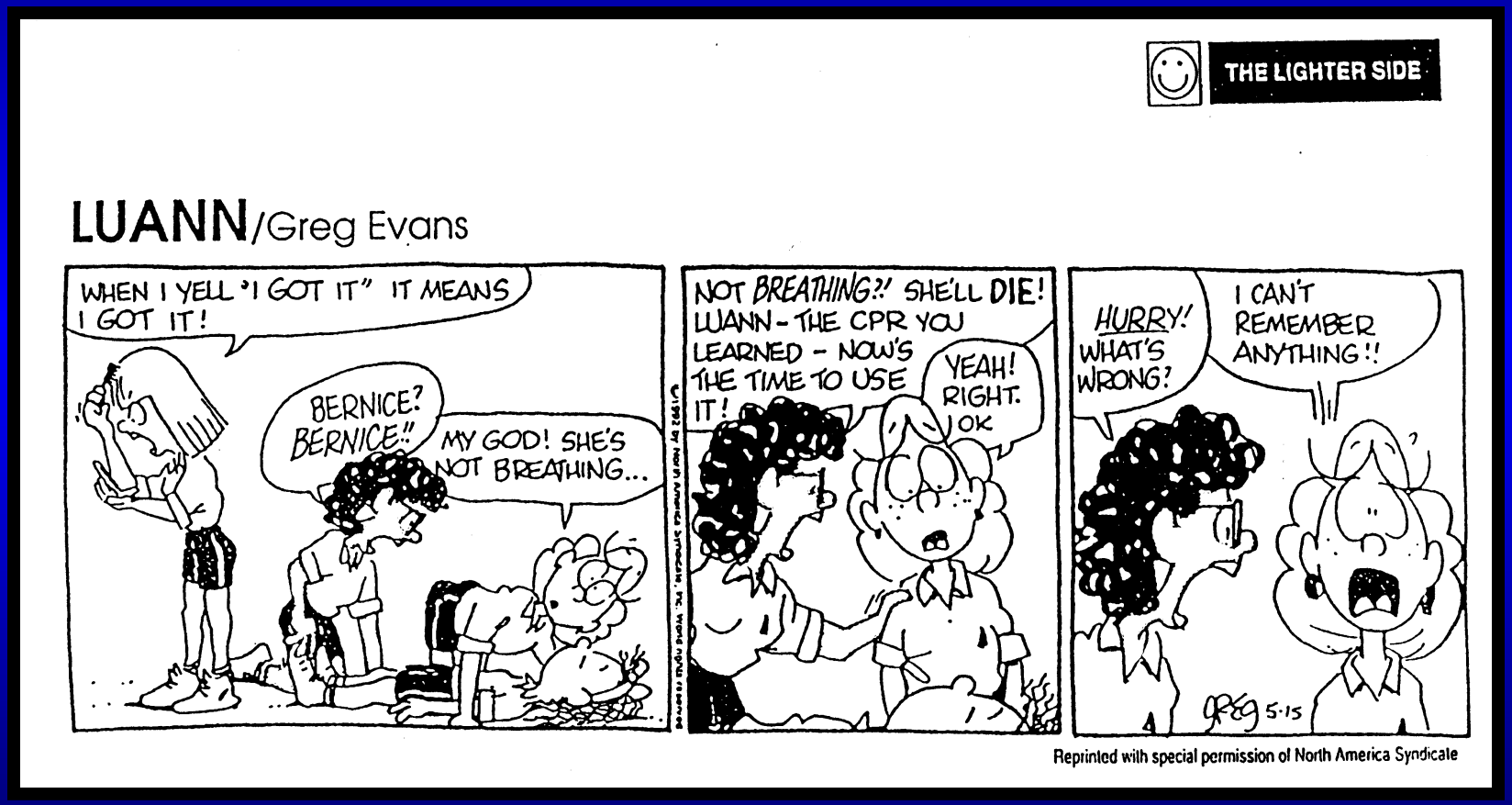
UNIFORMED SERVICES UNIVERSITY OF THE HEALTH SCIENCES

MILITARY TRAINING NETWORK

(301)295-2282

www.usuhs.mil/mtn/mtn.html

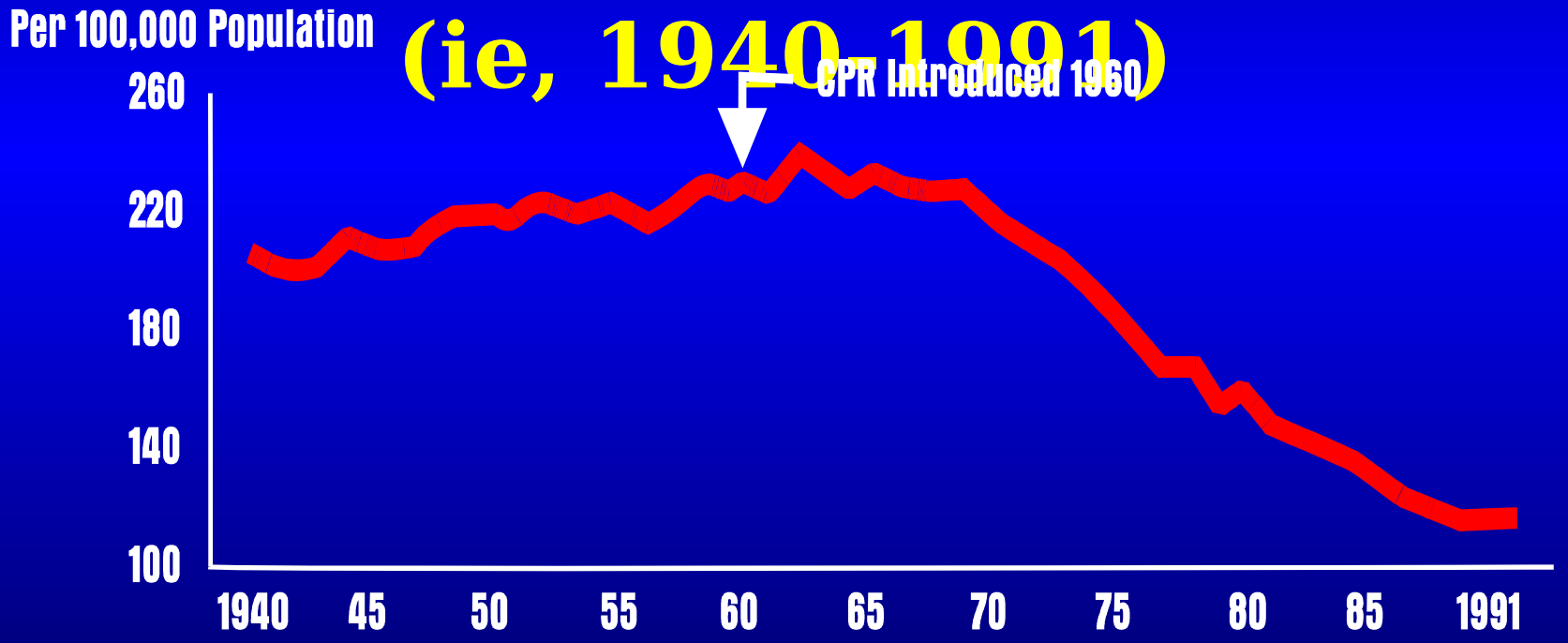
What is Cardiopulmonary Resuscitation - CPR ?


THE LIGHTER SIDE
LUANN/Greg Evans
WHEN I YELL "I GOT IT" IT MEANS I GOT IT!
BERNICE? BERNICE!!
MY GOD! SHE'S NOT BREATHING...
NOT BREATHING?! SHE'LL DIE! LUANN - THE CPR YOU LEARNED - NOW'S THE TIME TO USE IT!
YEAH! RIGHT. OK
HURRY! WHAT'S WRONG?
I CAN'T REMEMBER ANYTHING!!
GREG 5-15
Reprinted with special permission of North America Syndicate

WHEN SHOULD CPR BE STARTED ?

WHEN SHOULD CPR BE STOPPED ?

U.S. Death Rate (Age Adjusted) From Coronary Heart Disease Before and After the Introduction of CPR (ie, 1940-1991)



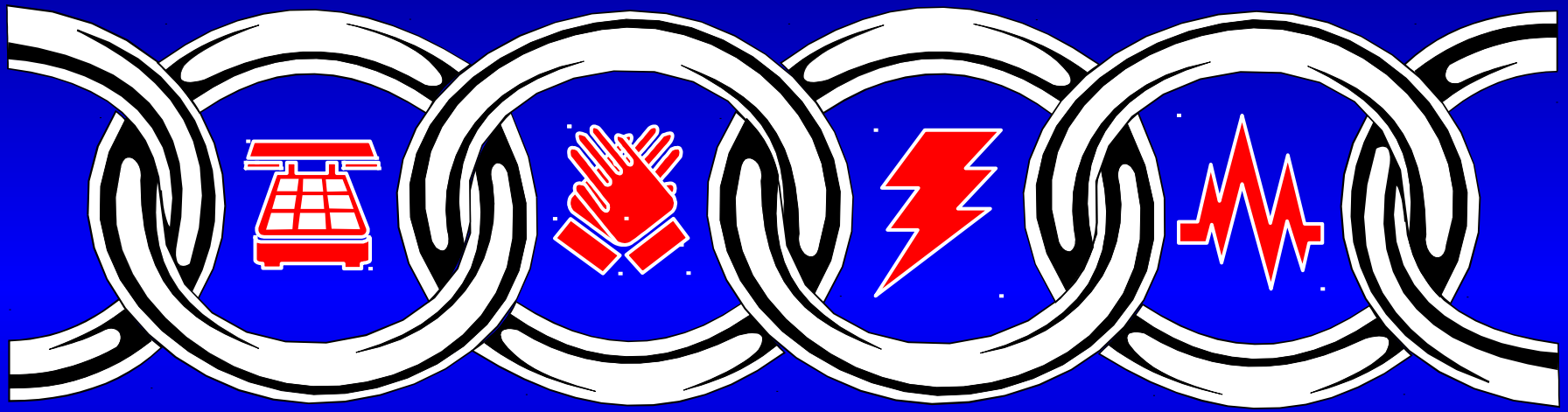
Cardiac Arrest From Abnormal Heart Rhythm

Survival Rate and Promptness of CPR and ACLS

Initiation of CPR (Minutes)	Arrival of ACLS (Minutes)	Survival Rate (%)
0-4	0-8	48
0-4	16+	10
8-12	8-16	6
8-12	16+	0
12+	12+	0

Adapted from Eisenberg MS, Bergner L, Hallstrom A: Cardiac resuscitio community: importance of rapid provision and implications for program JAMA 1979;241: 1905-1907.

Chain of Survival



Early Access

Early CPR

Early Defibrillation

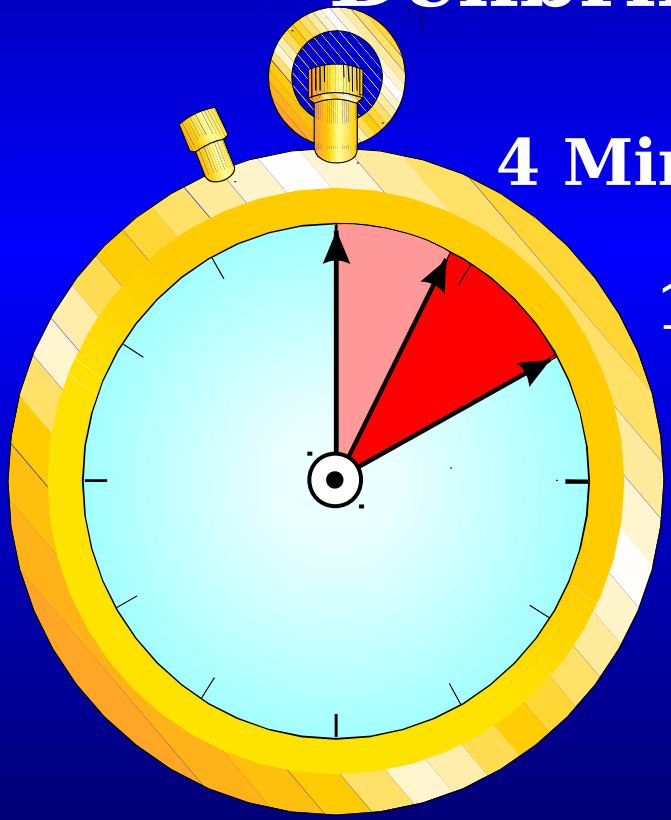
Early Advanced Care

Phone First !

Activate EMS (911)

Sudden Cardiac Death

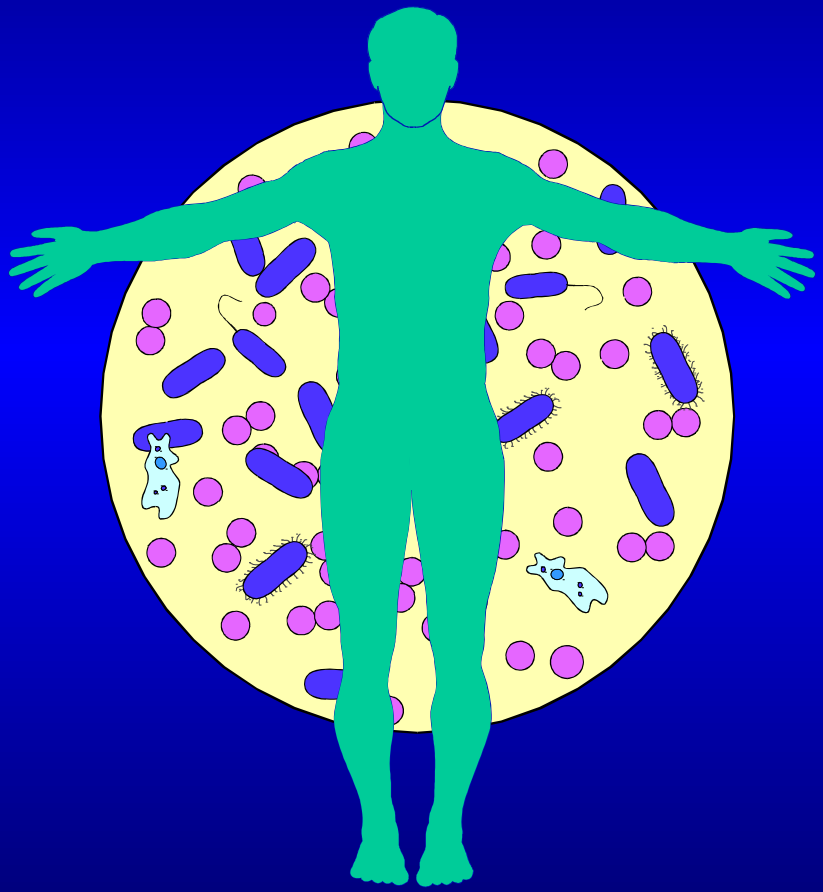
The Best Chance for Survival Depends on Early CPR and Early Defibrillation



4 Min: Brain Damage Begins

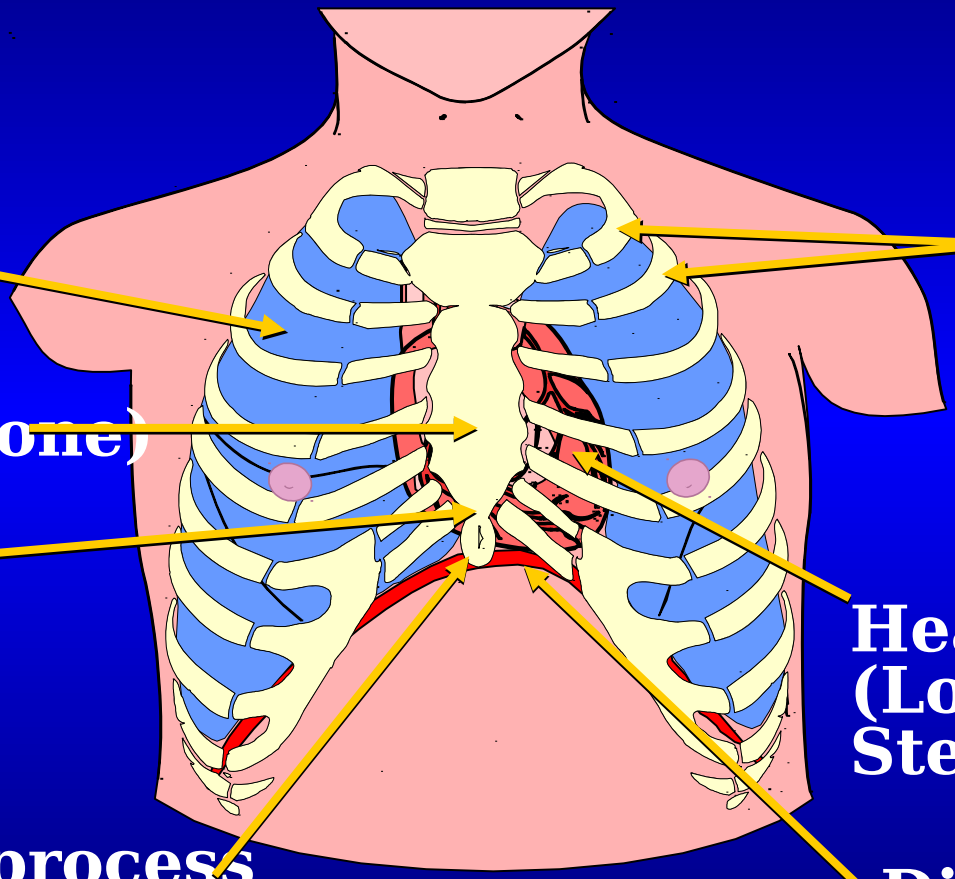
10 Min: Brain Death Certain

Disease Transmission During CPR Practice



Good Samaritan Law

Internal Organs of the Chest



Lung

Ribs

Sternum
(Breastbone)

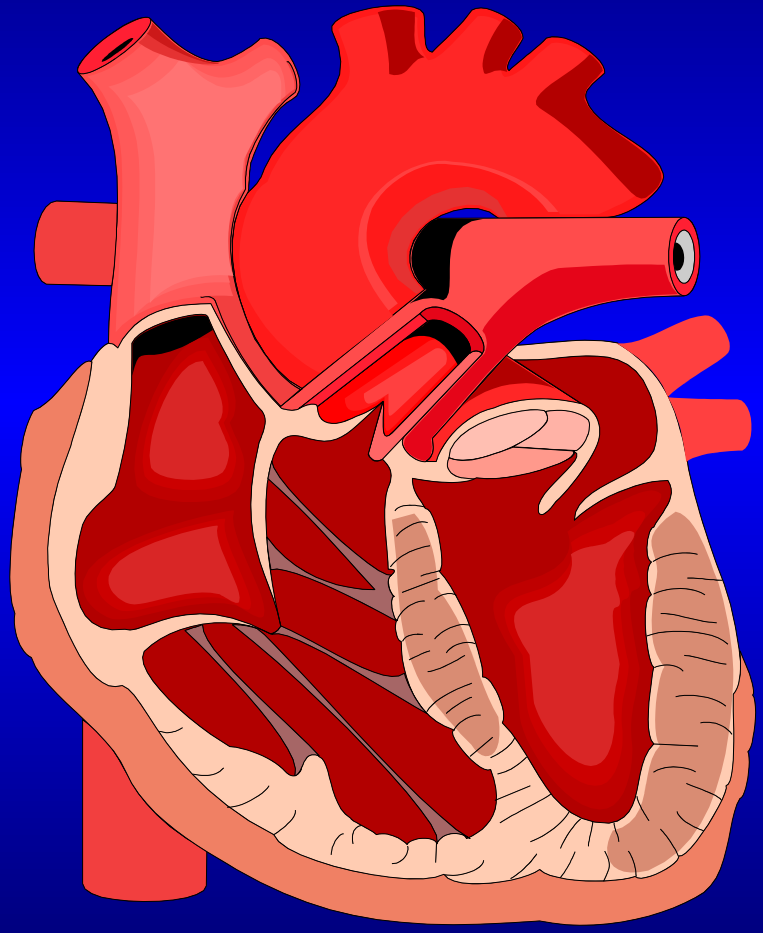
Notch

Heart
(Located between
Sternum and Spin

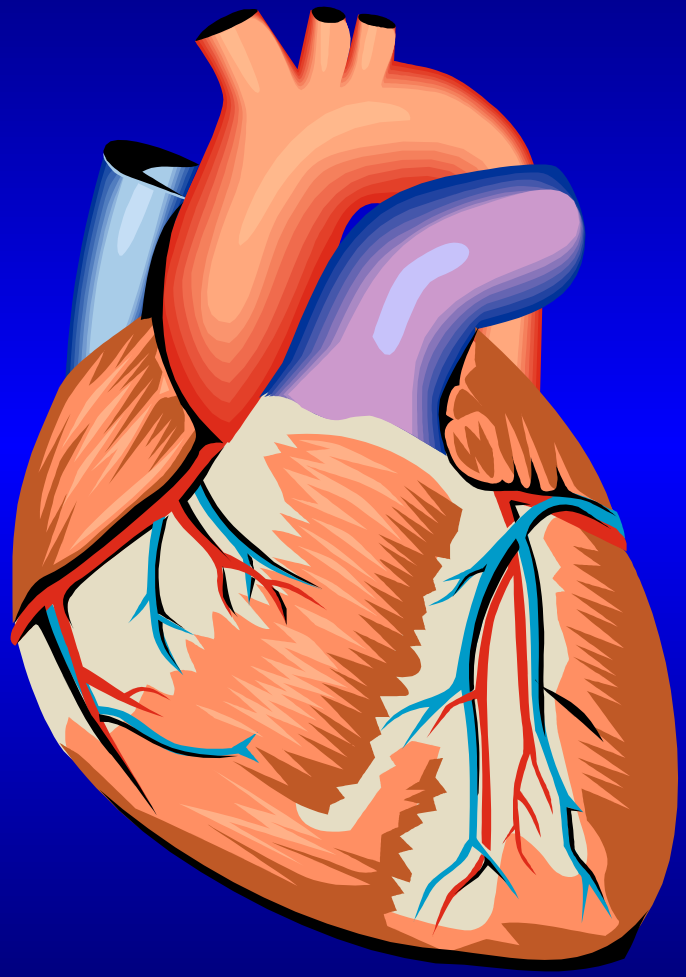
Xiphoid process
(Tip of the Sternum)

Diaphragm

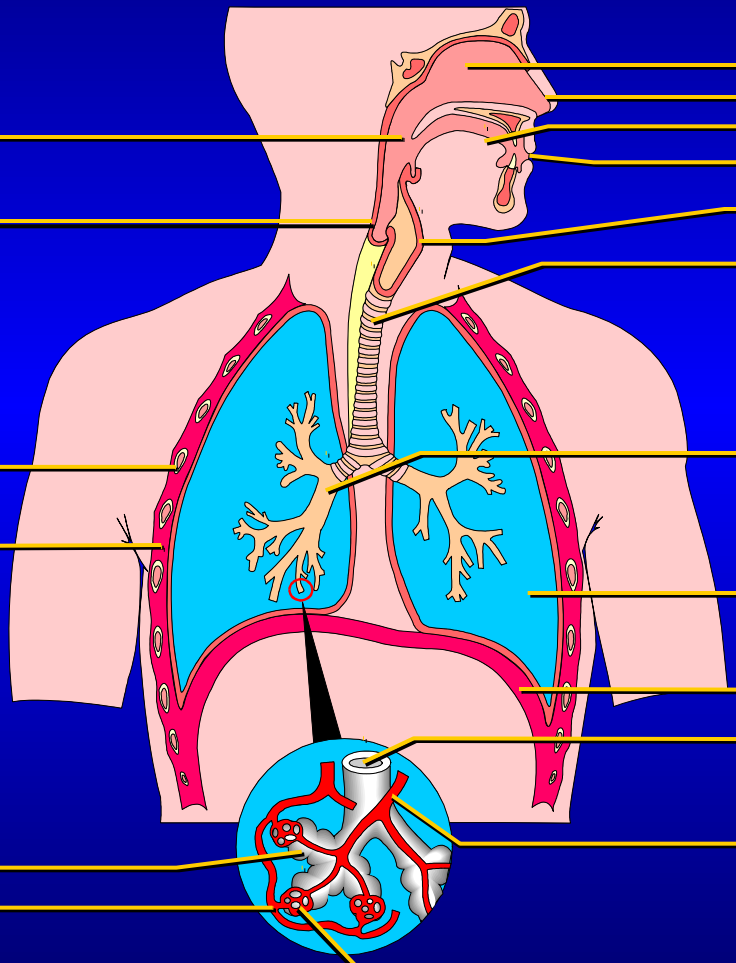
Heart Chamber and Valves



Anatomy of the Heart



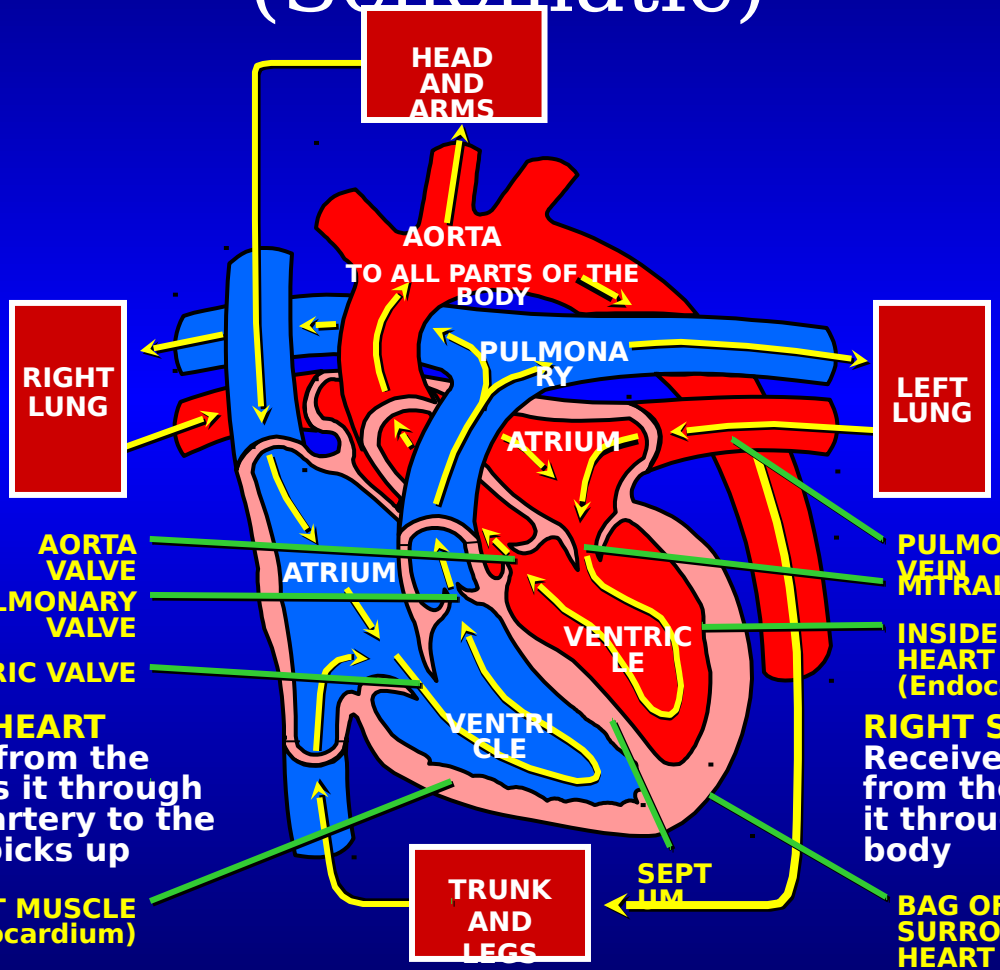
Anatomy of the Respiratory System



Nasopharynx
Nose
Tongue
Mouth
Larynx
Trachea
Pharynx (Throat)
(Esophagus)
Bronchi
Ribs
Muscles
Lungs
Diaphragm
Bronchiole
Pulmonary Artery
Alveolus (Air Sac)
Pulmonary Vein
Capillaries

Anatomy of the Heart

The Heart and How it Works (Schematic)



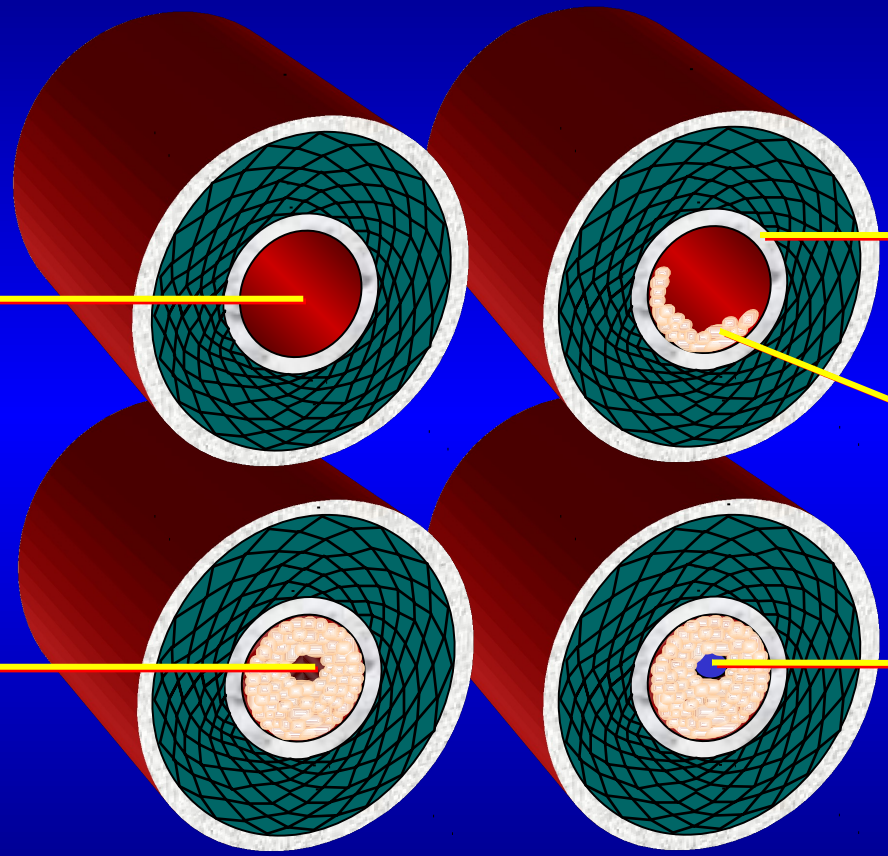
RIGHT SIDE OF HEART
Receives blood from the body and pumps it through the pulmonary artery to the lungs where it picks up oxygen

RIGHT SIDE OF HEART
Receives oxygenated blood from the lungs and pumps it through the aorta to the body

CORONARY HEART DISEASE

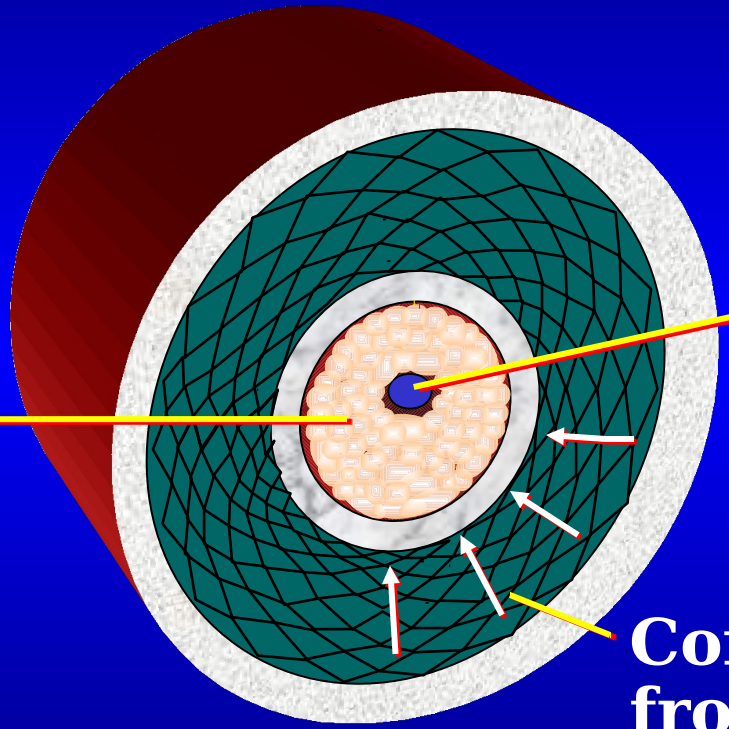
- ARTERIOSCLEROSIS
- ATHEROSCLEROSIS
- CORONARY ARTERY DISEASE
- CORONARY HEART DISEASE
- ISCHEMIC HEART DISEASE

Atherosclerotic Build-Up



Causes of Myocardial Infarction

Cross Section of a Coronary Artery

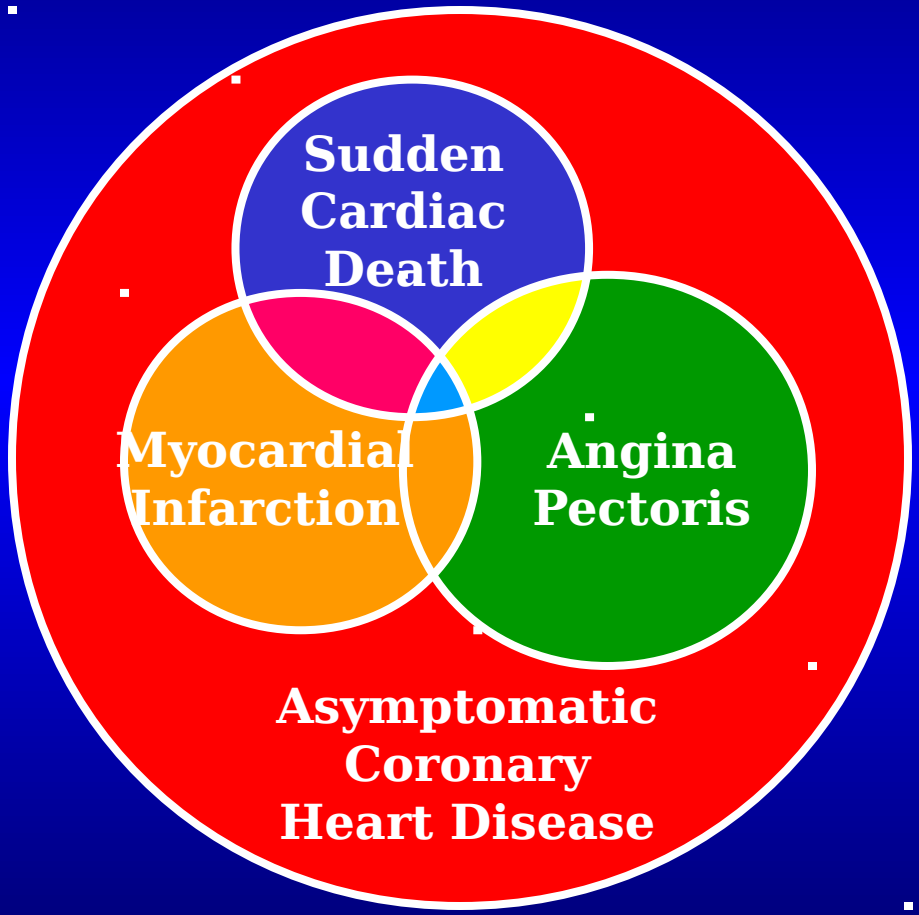


Blood Clot

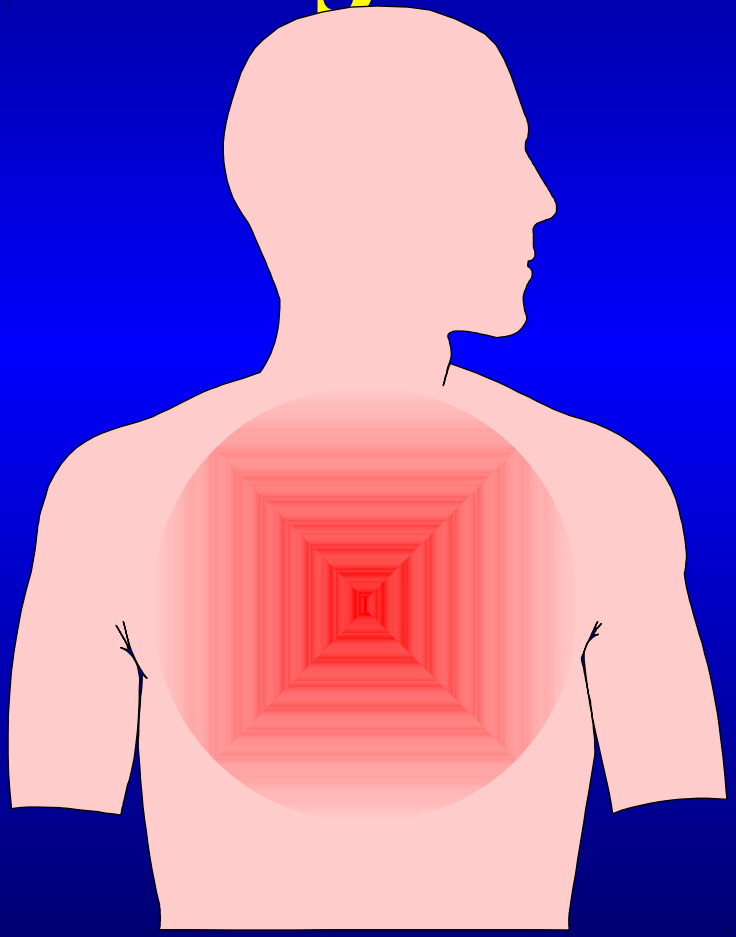
Coronary Atherosclerosis

Coronary Vasospasm from Contraction of Muscular Layer

Asymptomatic Coronary Heart Disease



Location and Intensity of Pain of Angina Pectoris



Actions for Survival

Person with unknown coronary heart disease:

- Recognize the signals of a heart attack
- Stop activity and sit or lie down
- Wait a few minutes to see if the symptoms go away.
  If the pain persists:

Person with known coronary heart disease (using nitroglycerin):

- Recognize the signals of a heart attack
- Stop activity and sit or lie down
- Take 1 nitroglycerin tablet at a time at 3-to 5-minute intervals to a maximum total dose 3 tablets.
  If the pain persists:

PHONE FIRST! Call 911, the EMS system, or local rescue unit

OR

If no EMS system is available, take victim at once to the nearest emergency department that offers 24-hour emergency cardiac care

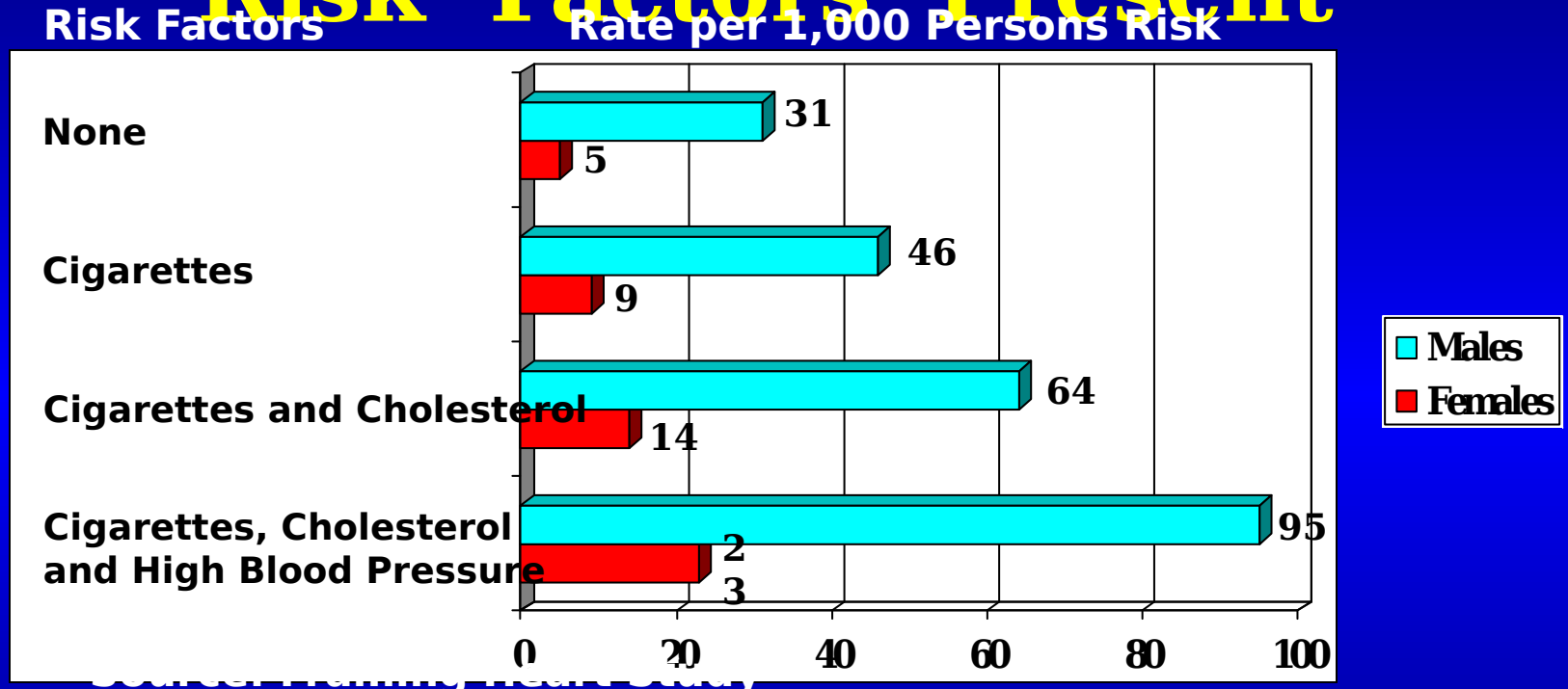
CONTROLLABLE RISK FACTORS

- CIGARETTE SMOKING
- HIGH BLOOD PRESSURE
- HIGH BLOOD CHOLESTEROL
- DIABETES
- OBESITY
- LACK OF EXERCISE
- STRESS

UNCONTROLLABLE RICK FACTORS

- PREDISPOSING HISTORY
- GENDER
- AGE
- RACE

The Danger of Heart Attack Increases With the Number of Risk Factors Present



Source: Framing Heart Study

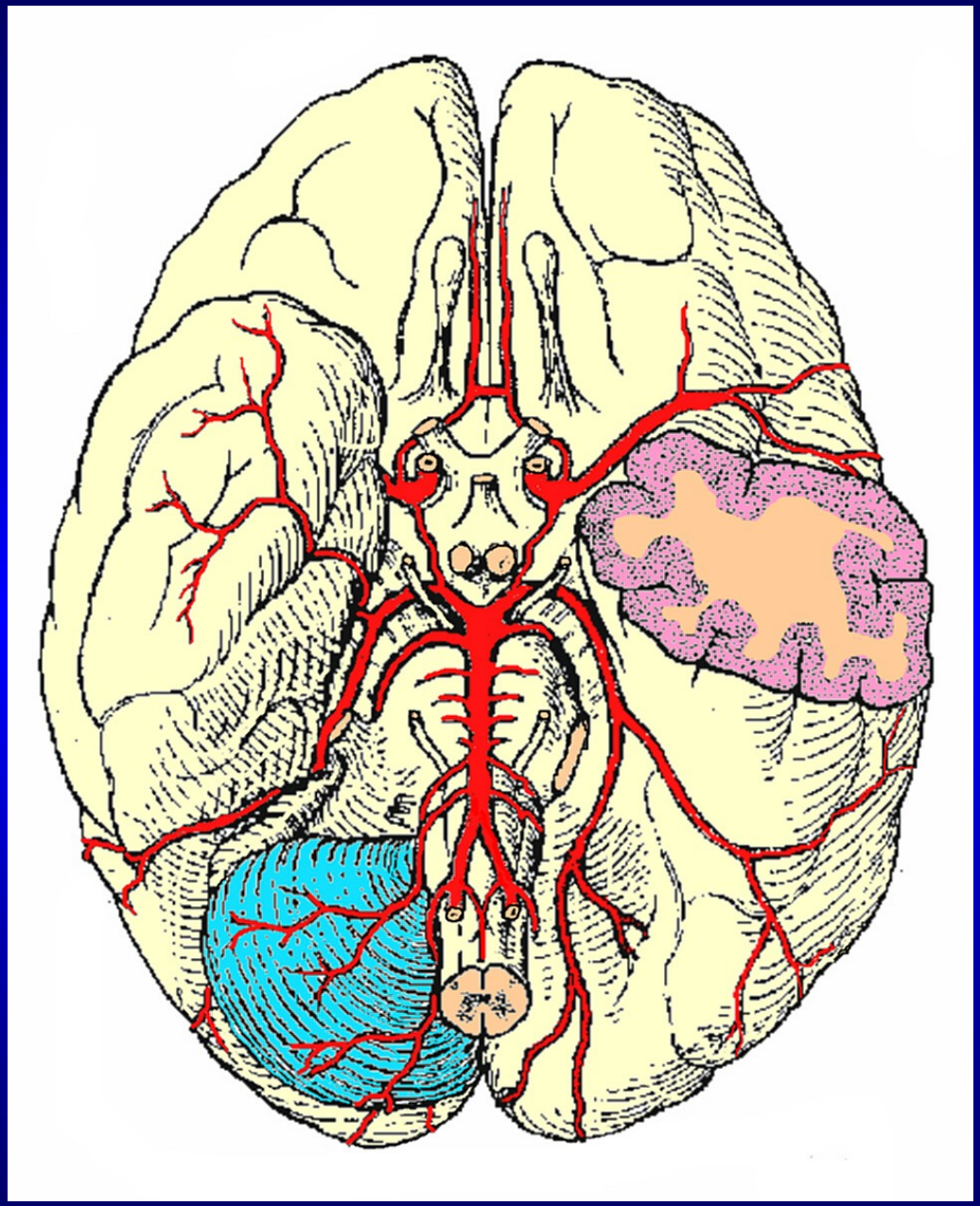
This chart shows how a combination of three major risk factors can
increase the likelihood of heart attack. This chart uses an abnormal
blood pressure level of 150 systolic and a cholesterol level of 260 in
a 55-year-old male and female.

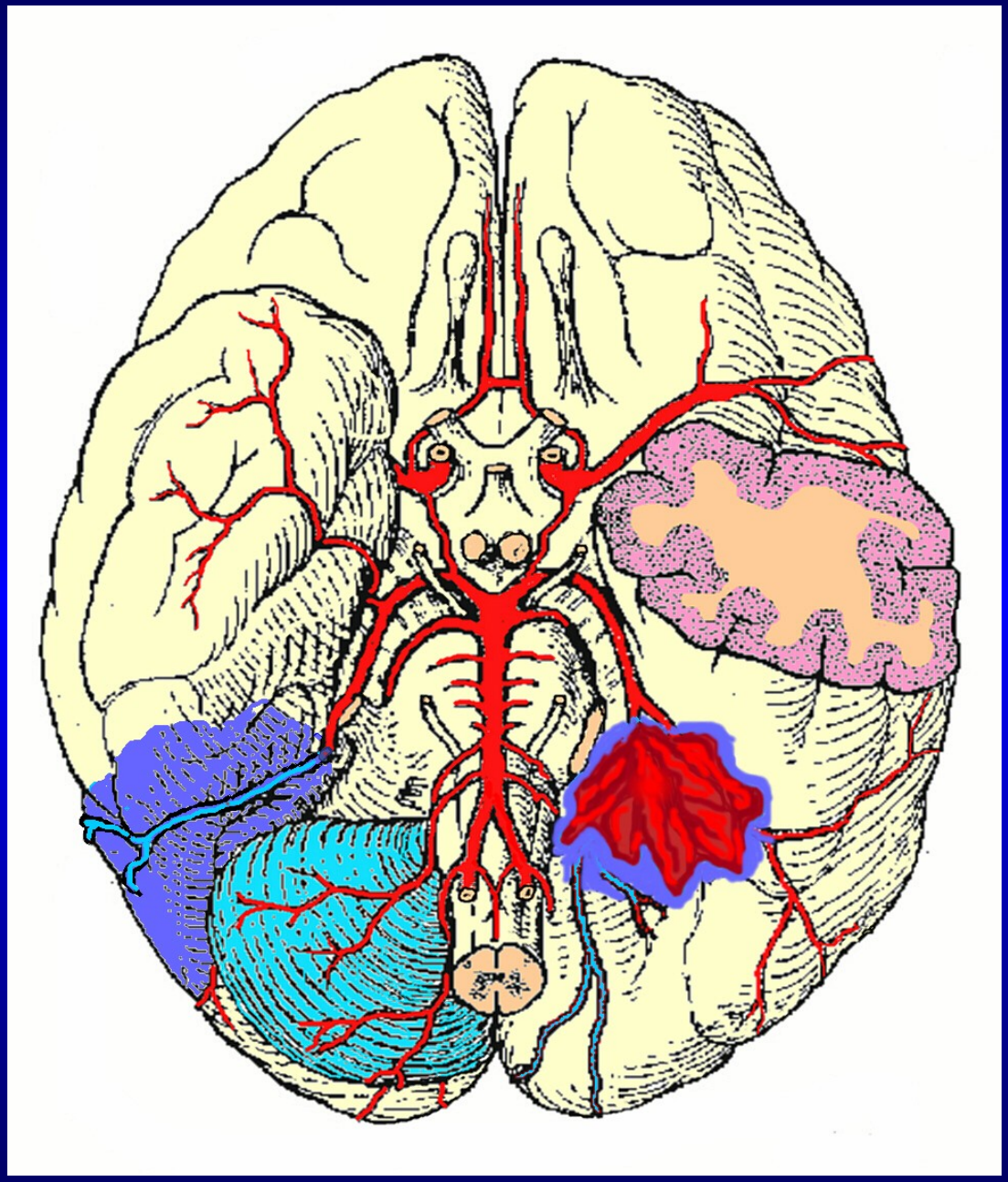
STROKE

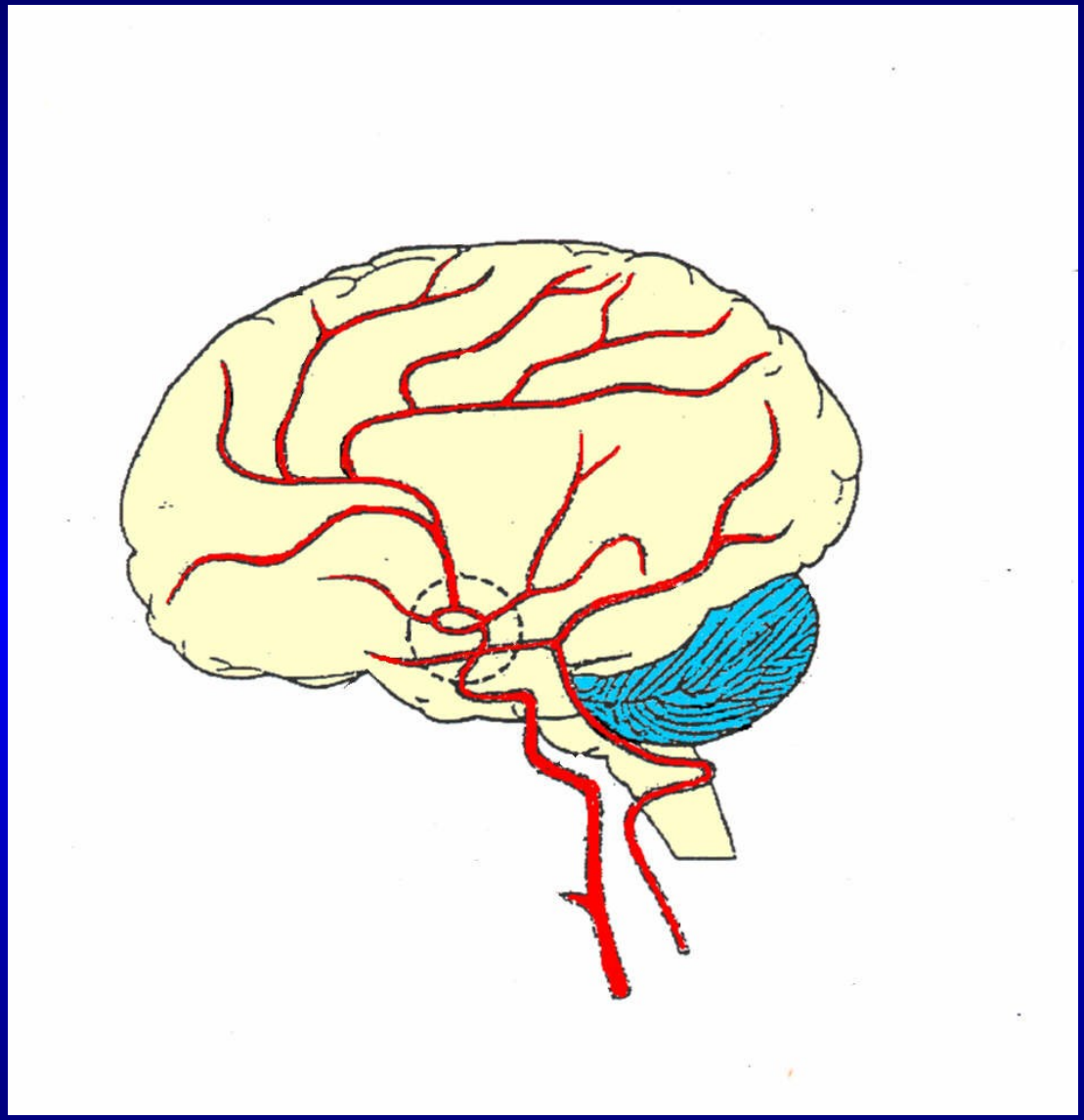
AMERICAN HEART ASSOCIATION STROKE VIDEO

PATHOPHYSIOLOGY OF STROKE

- ISCHEMIC STROKE
- HEMORRHAGIC







DON'T MISS THE WARNING SIGNS OF A STROKE

- SUDDEN BLURRED OR DECREASED VISION IN ONE OR BOTH EYES
- NUMBNESS, WEAKNESS, OR PARALYSIS OF THE FACE, OR IN EITHER AN ARM OR LEG OR ON EITHER OR BOTH SIDES OF BODY
- DIFFICULTY SPEAKING OR UNDERSTANDING

WARNING SIGNS (cont.)

- DIZZINESS, LOSS OF BALANCE OR AN UNEXPLAINED FALL
- DIFFICULTY SWALLOWING
- HEADACHE (USUALLY SEVERE AND OF ABRUPT ONSET) OR UNEXPLAINED CHANGE IN THE PATTERN OF HEADACHES

STROKE RISK FACTORS

- **UNCONTROLLABLE**
  - **OLDER AGE**
  - **MALE GENDER**
  - **RACE**
  - **DIABETES MELLITUS**
  - **PRIOR STROKE**
  - **FAMILY HISTORY OF STROKE**
  - **ASYMPTOMATIC CAROTID BRUIT**

STROKE RISK FACTORS

- CONTROLLABLE
- HYPERTENSION
  - HEART DISEASE (ESPECIALLY ATRIAL FIBRILLATION)
  - CIGARETTE SMOKING
  - TRANSIENT ISCHEMIC ATTACK (TIA)
  - INCREASED RED BLOOD CELL COUNT

SECONDARY

- **INCREASED SERUM CHOLESTEROL**
- **PHYSICAL INACTIVITY/OBESITY**

ACTIONS FOR SURVIVAL OF STROKE

7 D's

SPECIAL SITUATIONS (ADULT)

- HYPOTHERMIA
- NEAR DROWNING
- TRAUMA
- ELECTRICAL SHOCK
- PREGNANCY
- ALLERGIES
- ASPHYXIATION

SPECIAL SITUATIONS (CHILD & INFANT)

- MOTOR VEHICLE
- SUBMERSION
- FIREARM INJURIES
- BURNS/SMOKE INHALATION
- AIRWAY OBSTRUCTION
- POISONING
- OTHER CAUSES

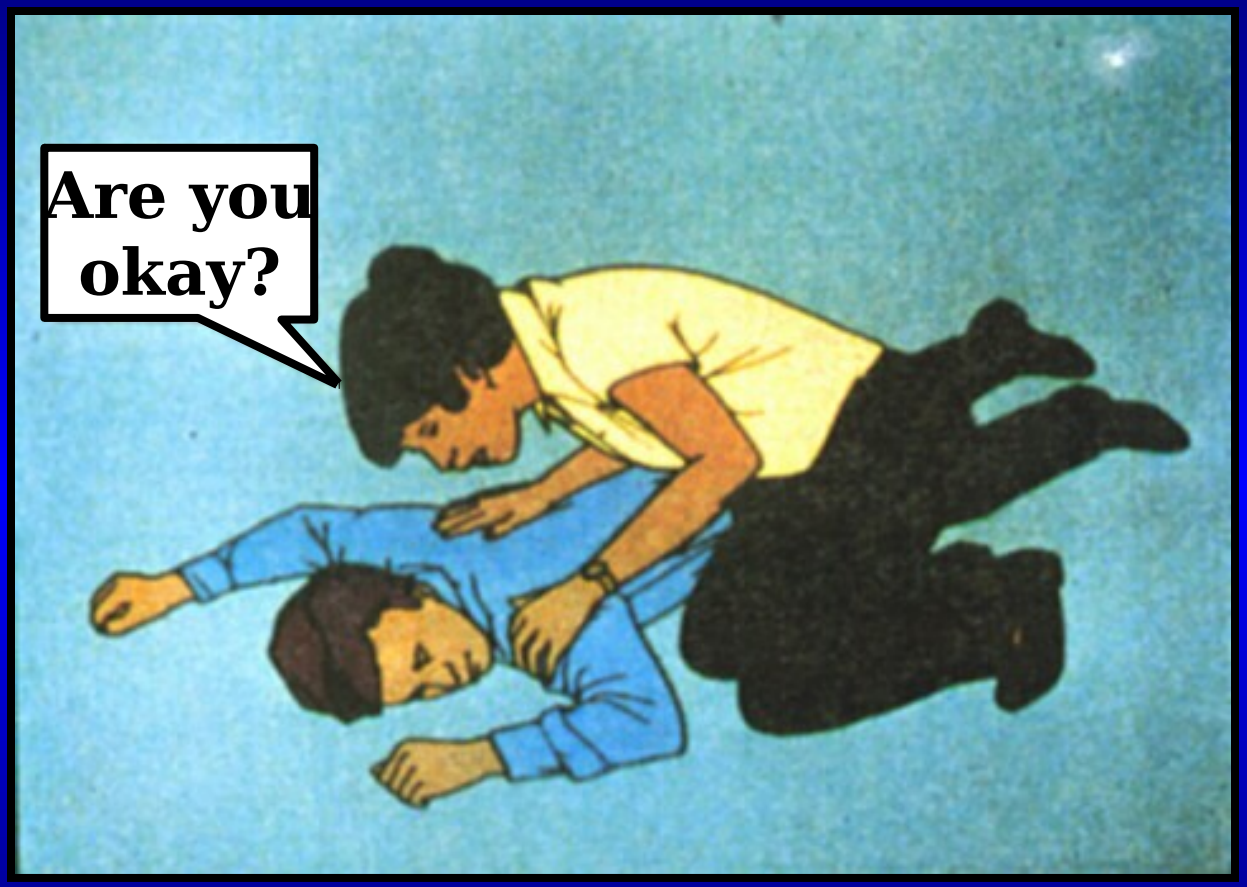
SAFETY
&
CHILD
PROOFING

CARDIOPULMONARY RESUSCITATION

THE TECHNICAL ASPECTS OF ADULT CPR

- DETERMINE UNRESPONSIVENESS
- CALL FOR HELP
- POSITION THE VICTIM
- OPEN THE AIRWAY
- DETERMINE BREATHLESSNESS
- GIVE 2 RESCUE BREATHS
- CHECK CIRCULATION - DOES THE VICTIM HAVE A PULSE ?
- PERFORM CHEST COMPRESSIONS

Determine Unresponsiveness



- ASSESS ANY INJURY AND DETERMINE UNRESPONSIVENESS
- GENTLY TAP OR SHAKE THE VICTIM, SHOUT “ARE YOU O.K.

Call for Help

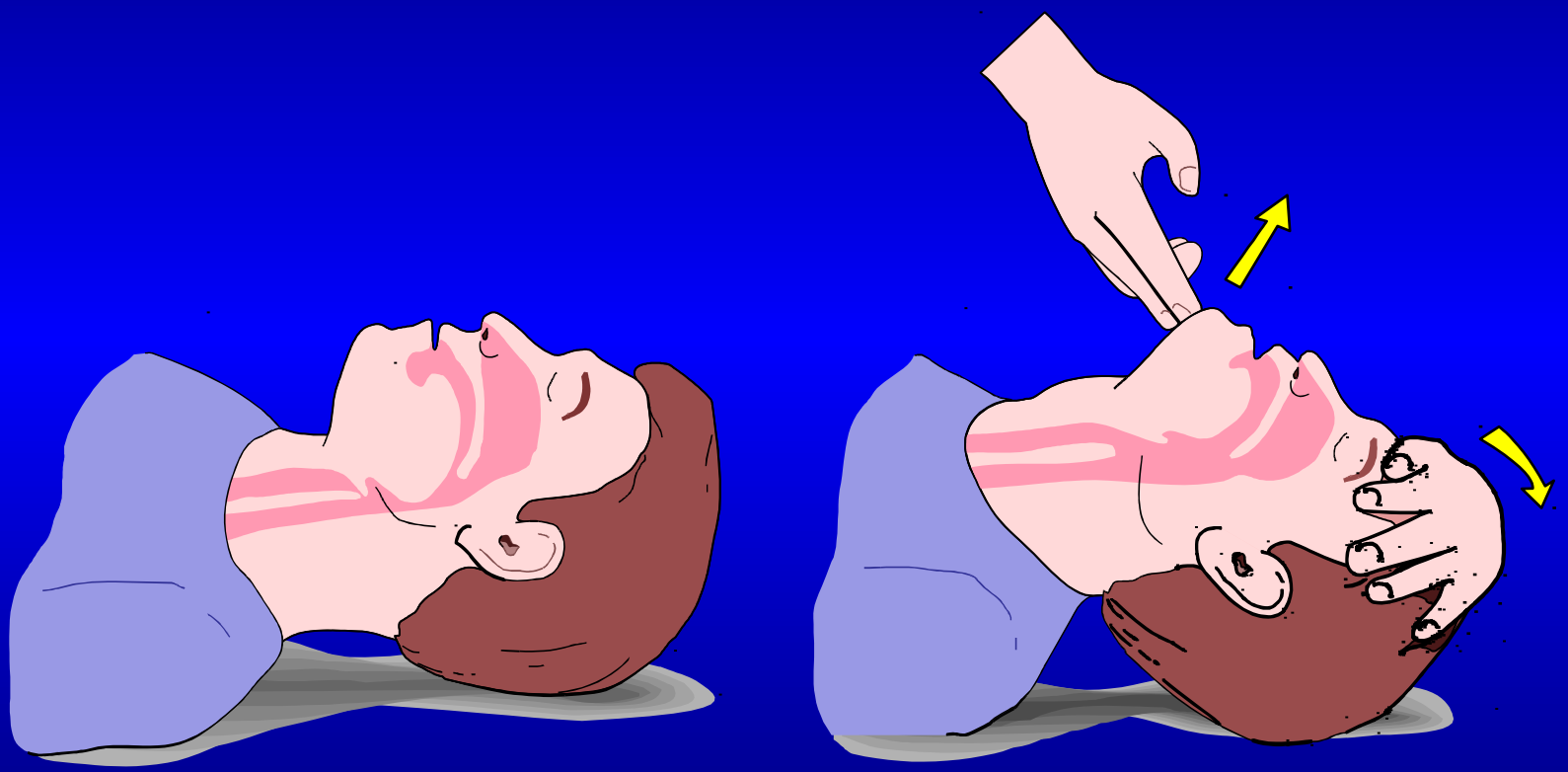
For Emergency, Dial 911 or Your Local EMS Number

PROMPTLY ACTIVATE EMS

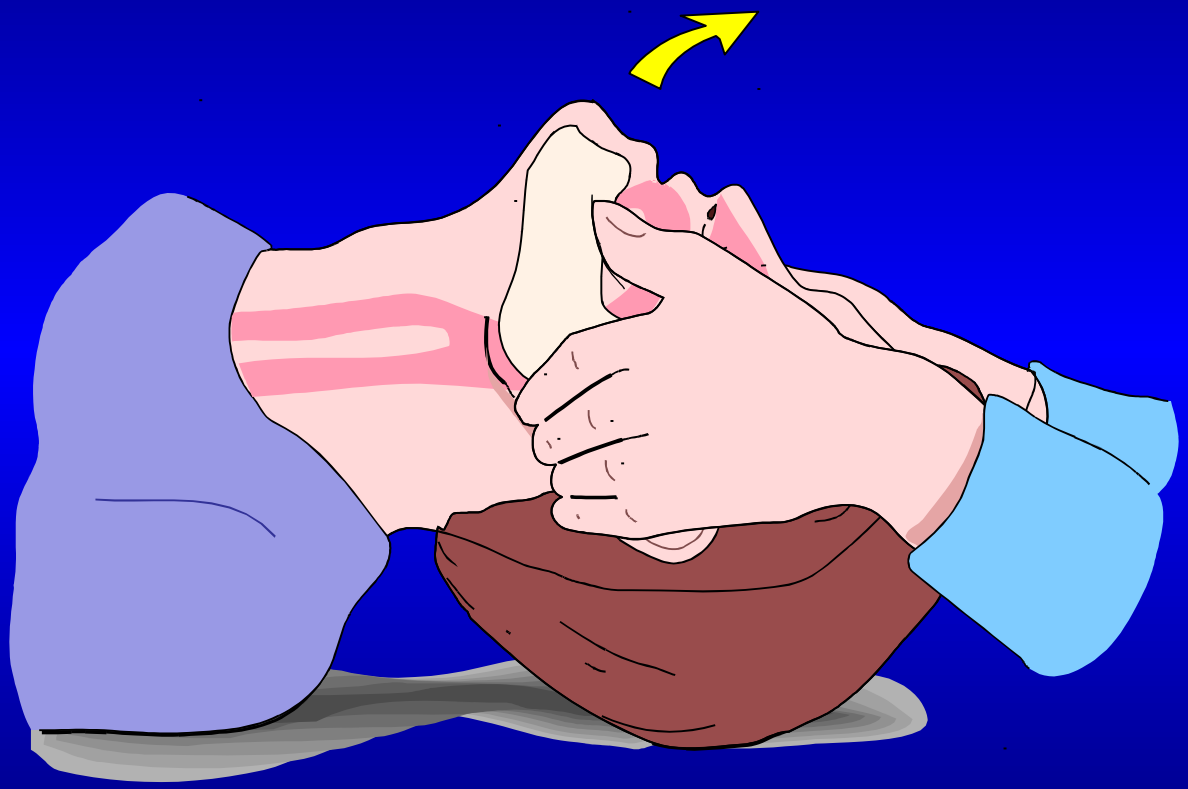
Position the Victim

- **SUPINE POSITION**
- **SPINAL PRECAUTIONS**

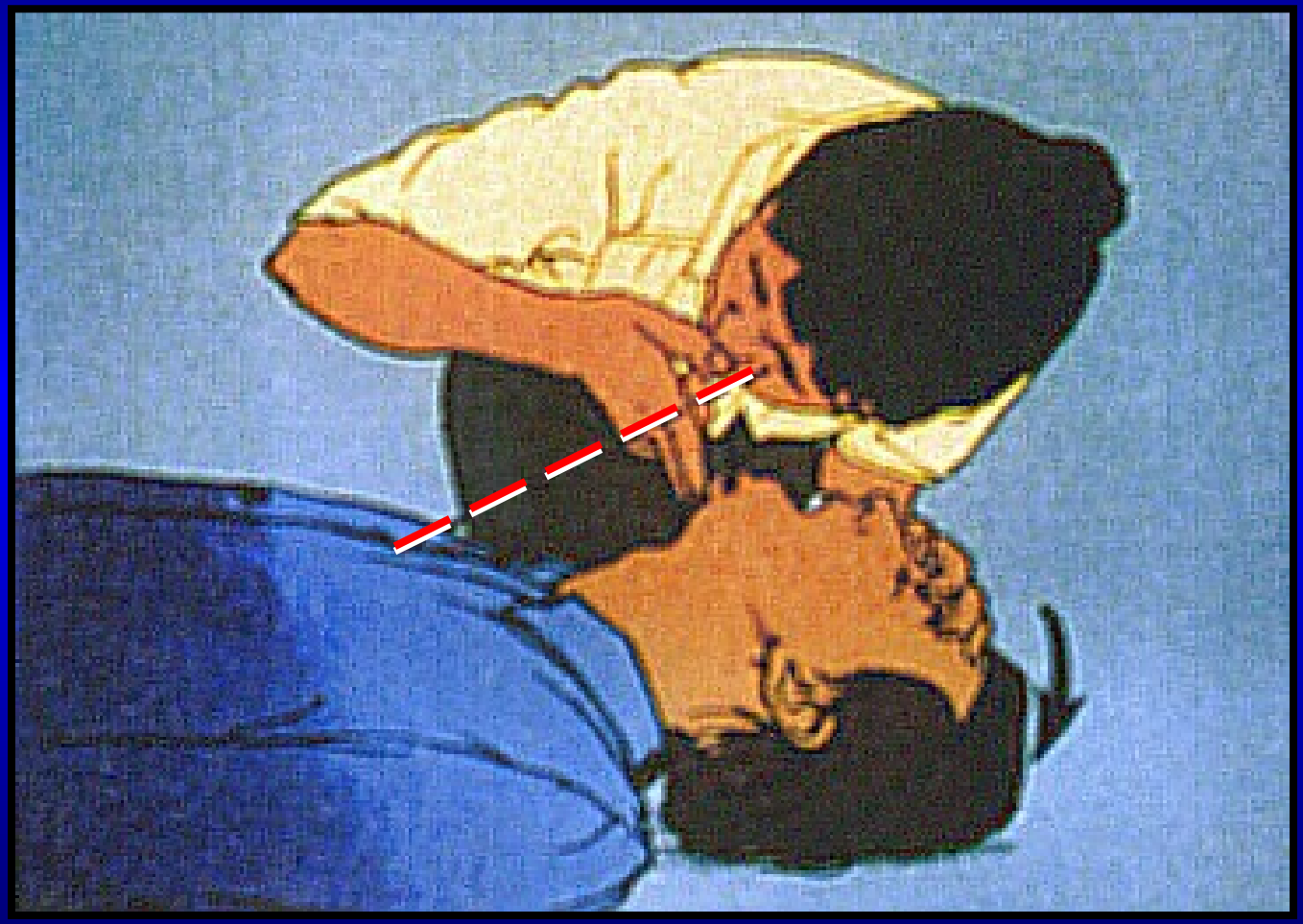
Open the Airway: Head Tilt-Chin Lift

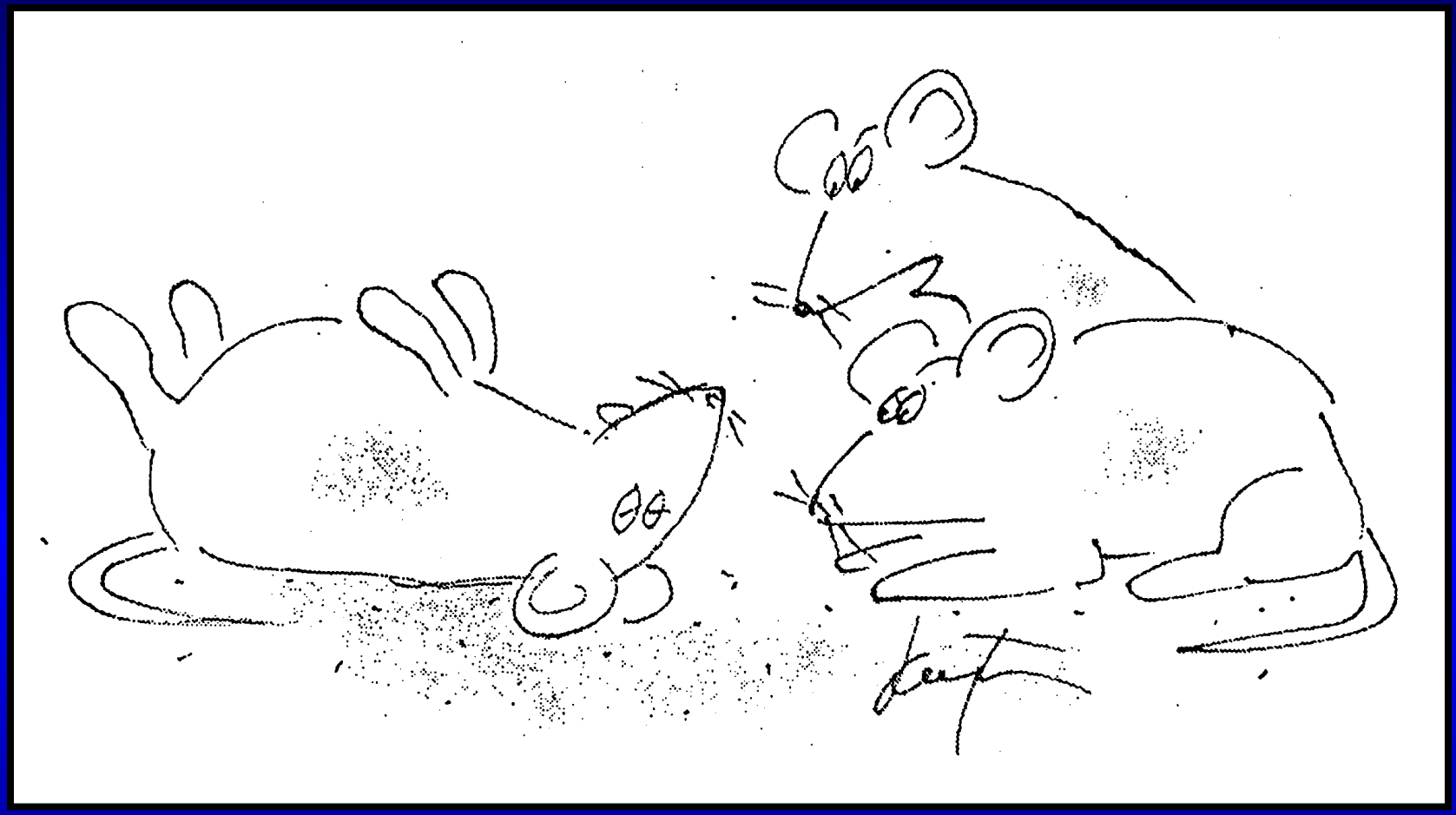


Jaw Thrust



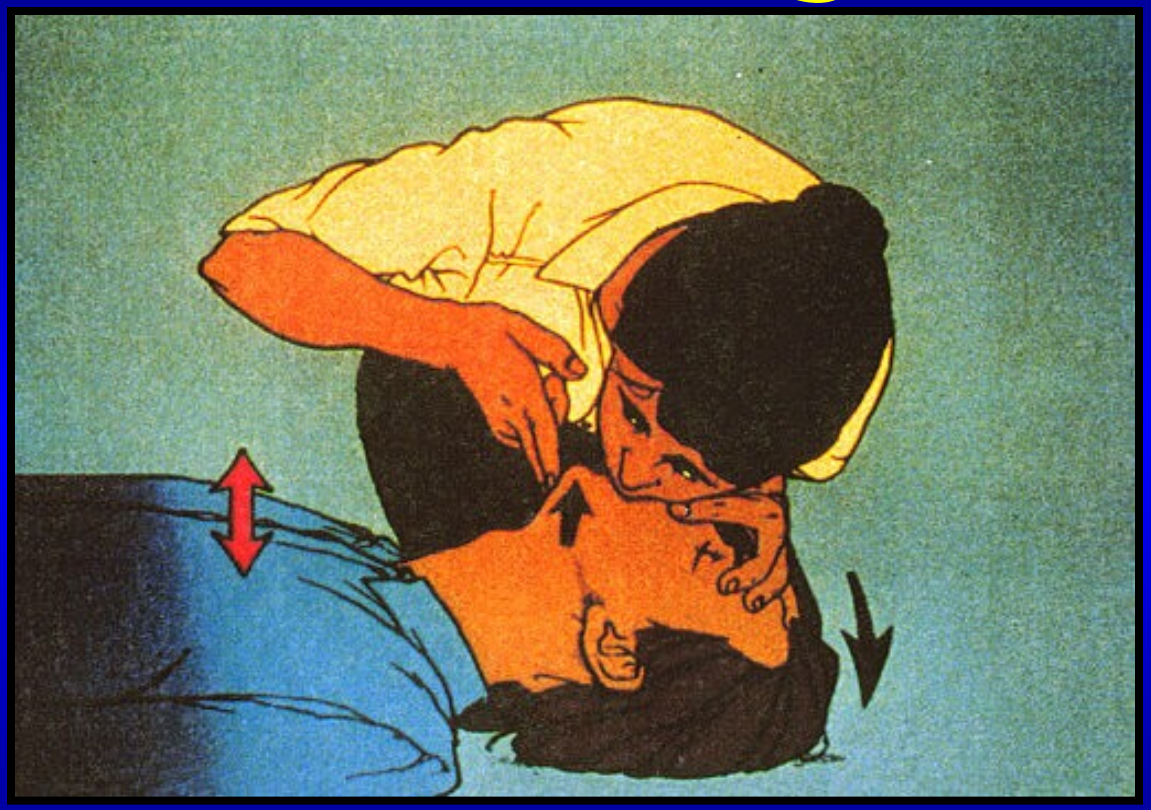
Assessment: Determine Breathlessness





**“There’s only one thing we can do to save him.
Mouse-to-mouse resuscitation.”**

Mouth-to-Mouth Rescue Breathing

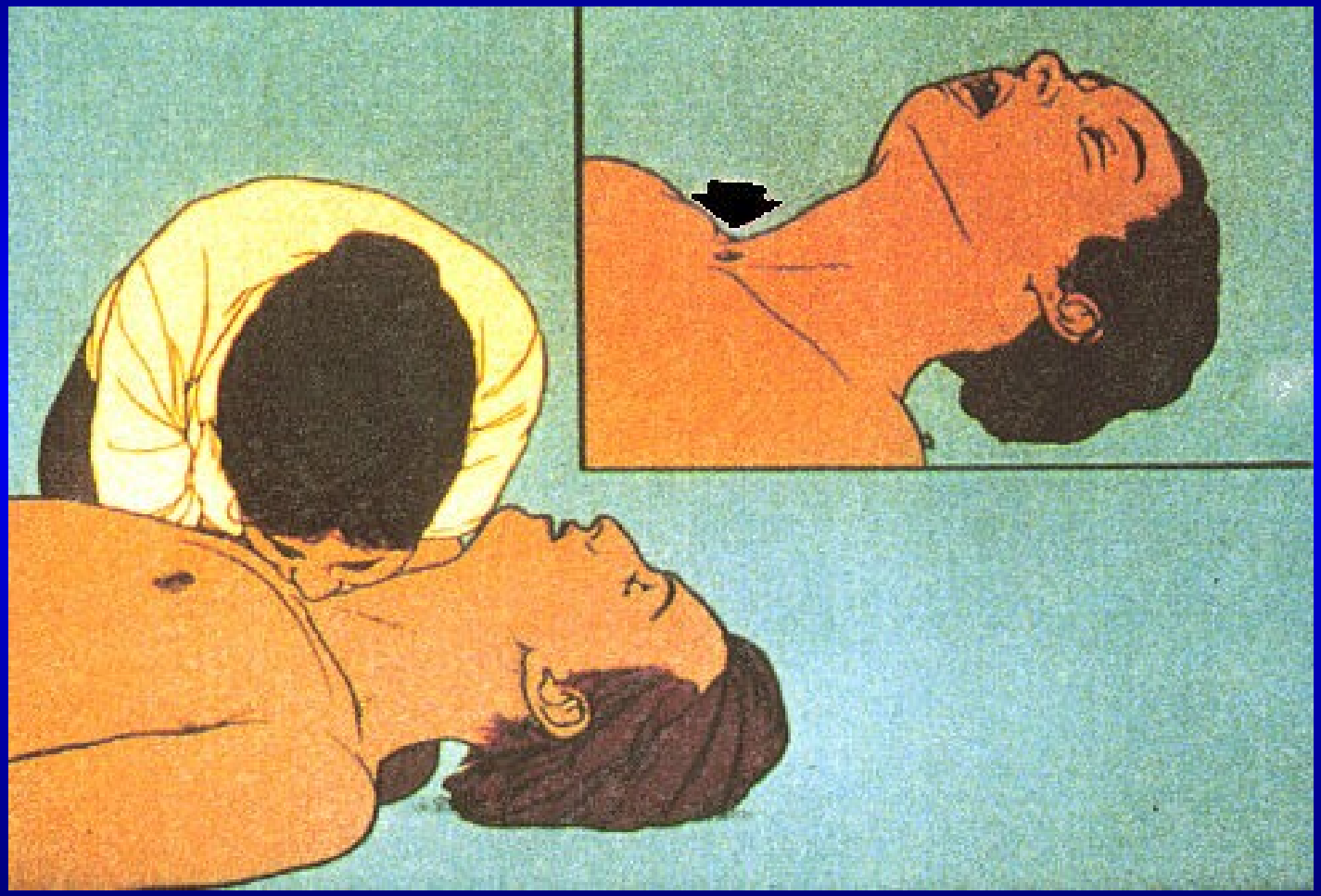


- LENGTH OF VENTILATION: 2 SECONDS PER BREATH
- CORRECT VOLUME FOR EACH BREATH IS VOLUME CAUSES THE CHEST TO RISE

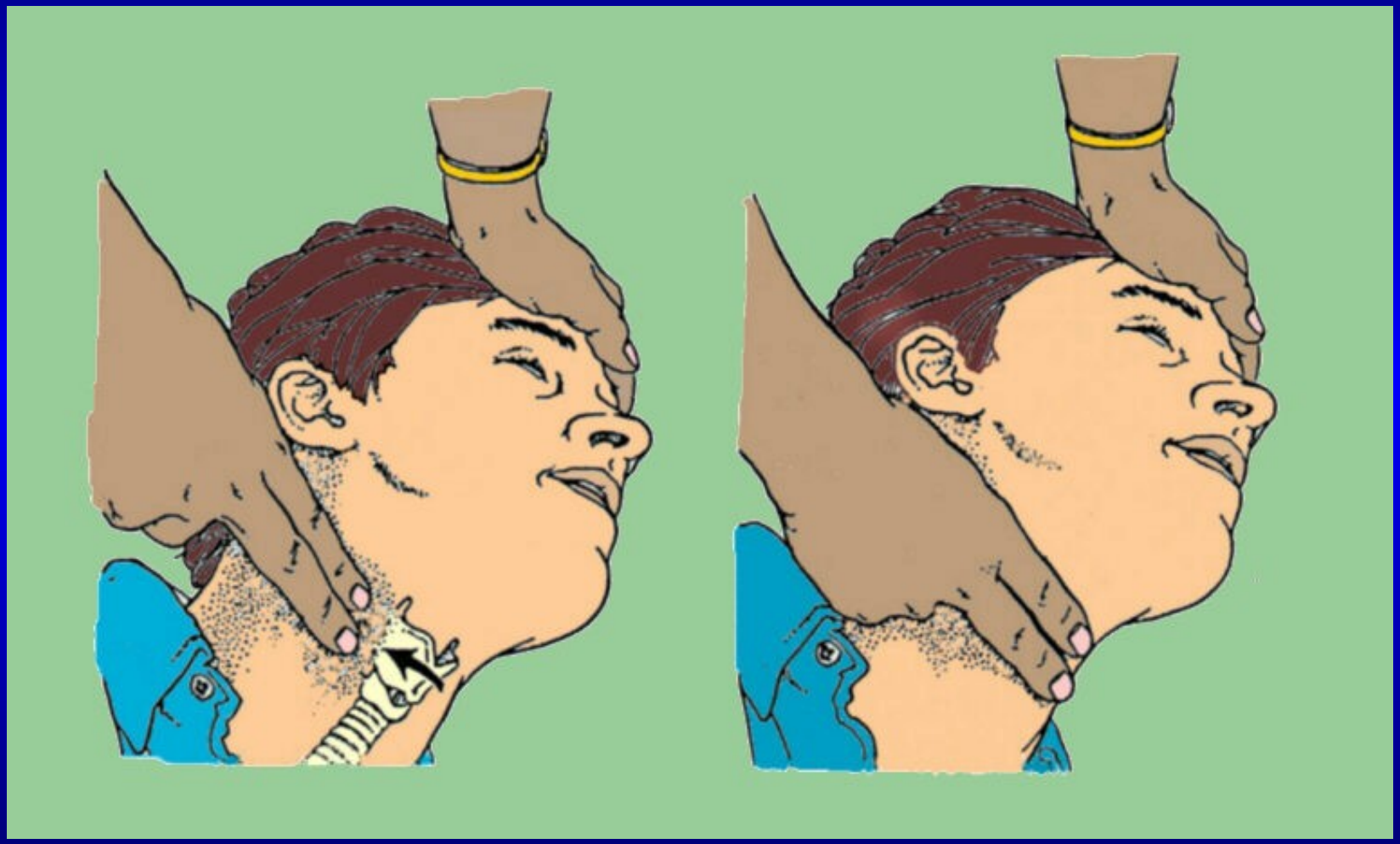
Mouth-to-Nose Rescue Breathing

Determine Breathlessness

Mouth-to-Stoma Rescue Breathing

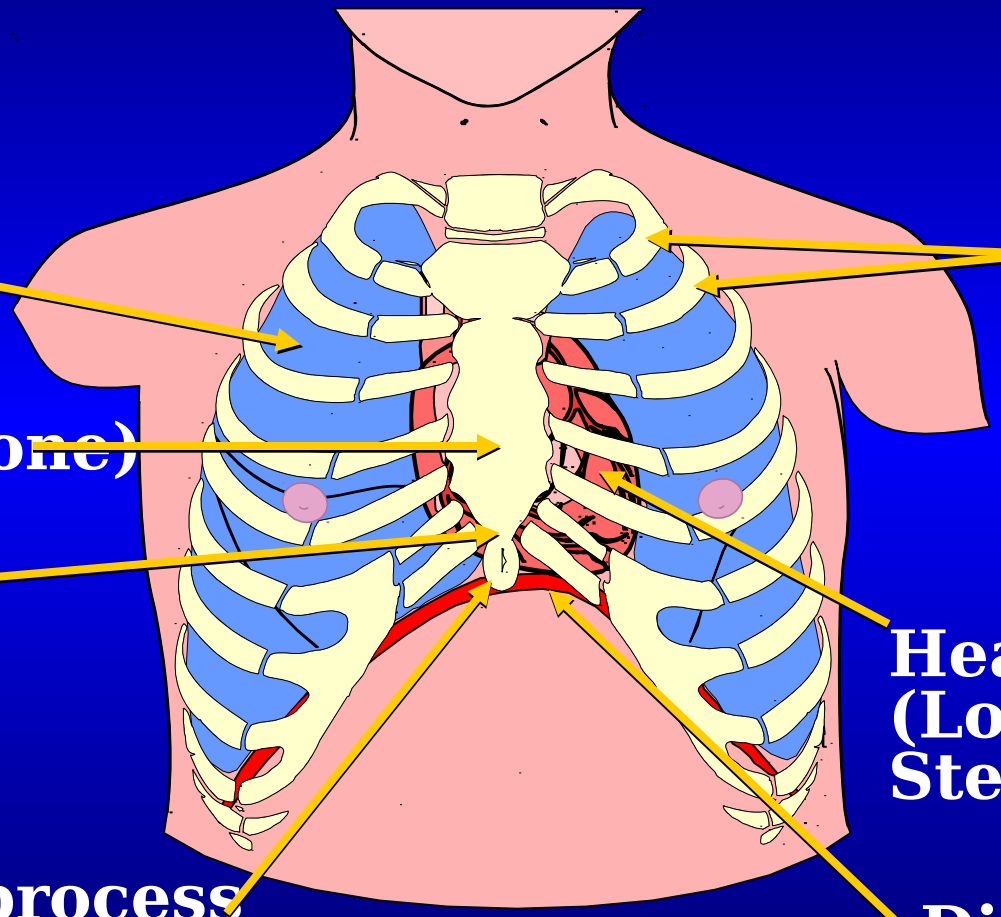


Assessment: Determine Pulselessness



Chest Compressions

Landmark for External Chest Compressions



Lung

Ribs

Sternum
(Breastbone)

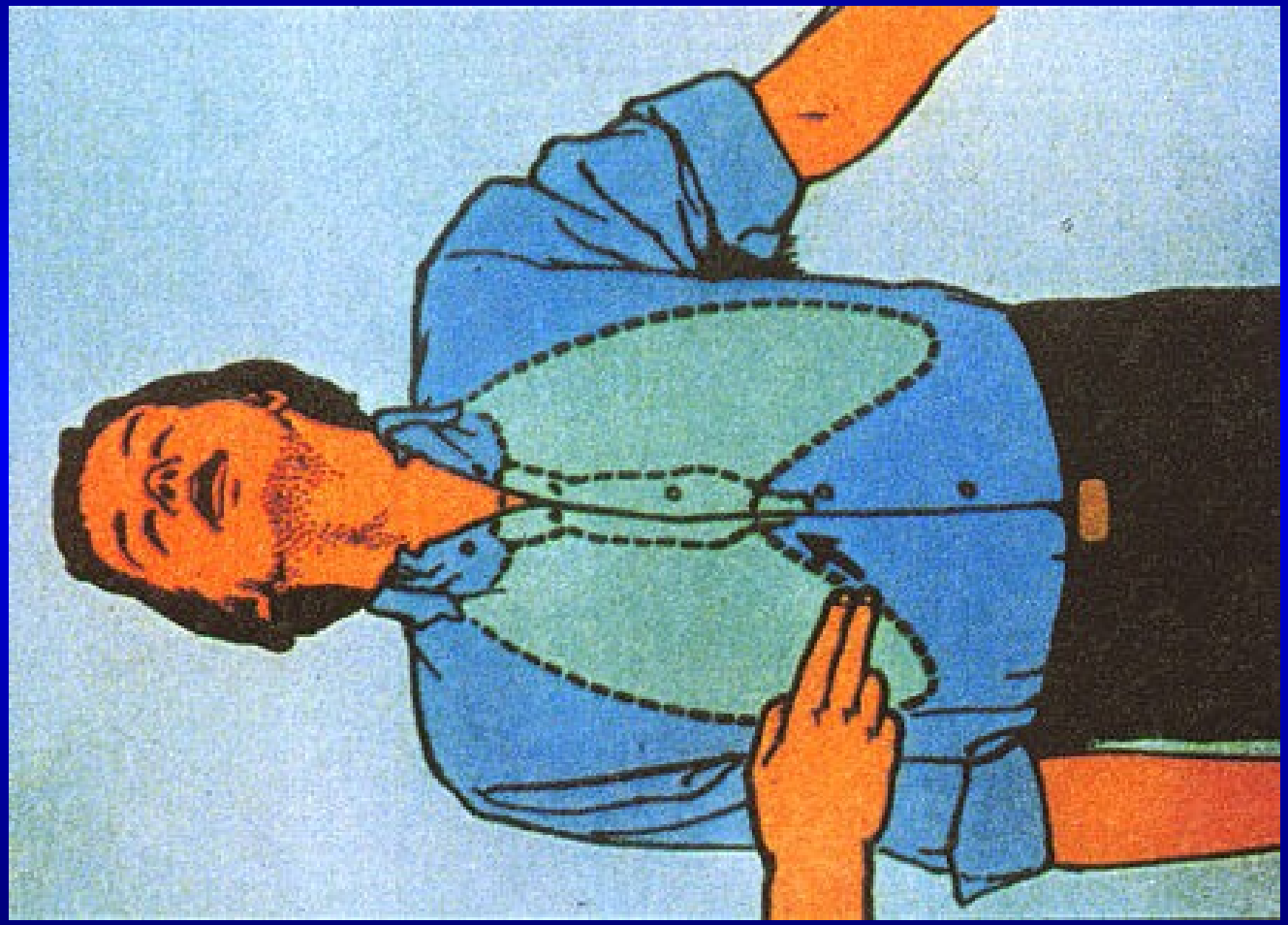
Notch

Heart
(Located betwee
Sternum and Spi

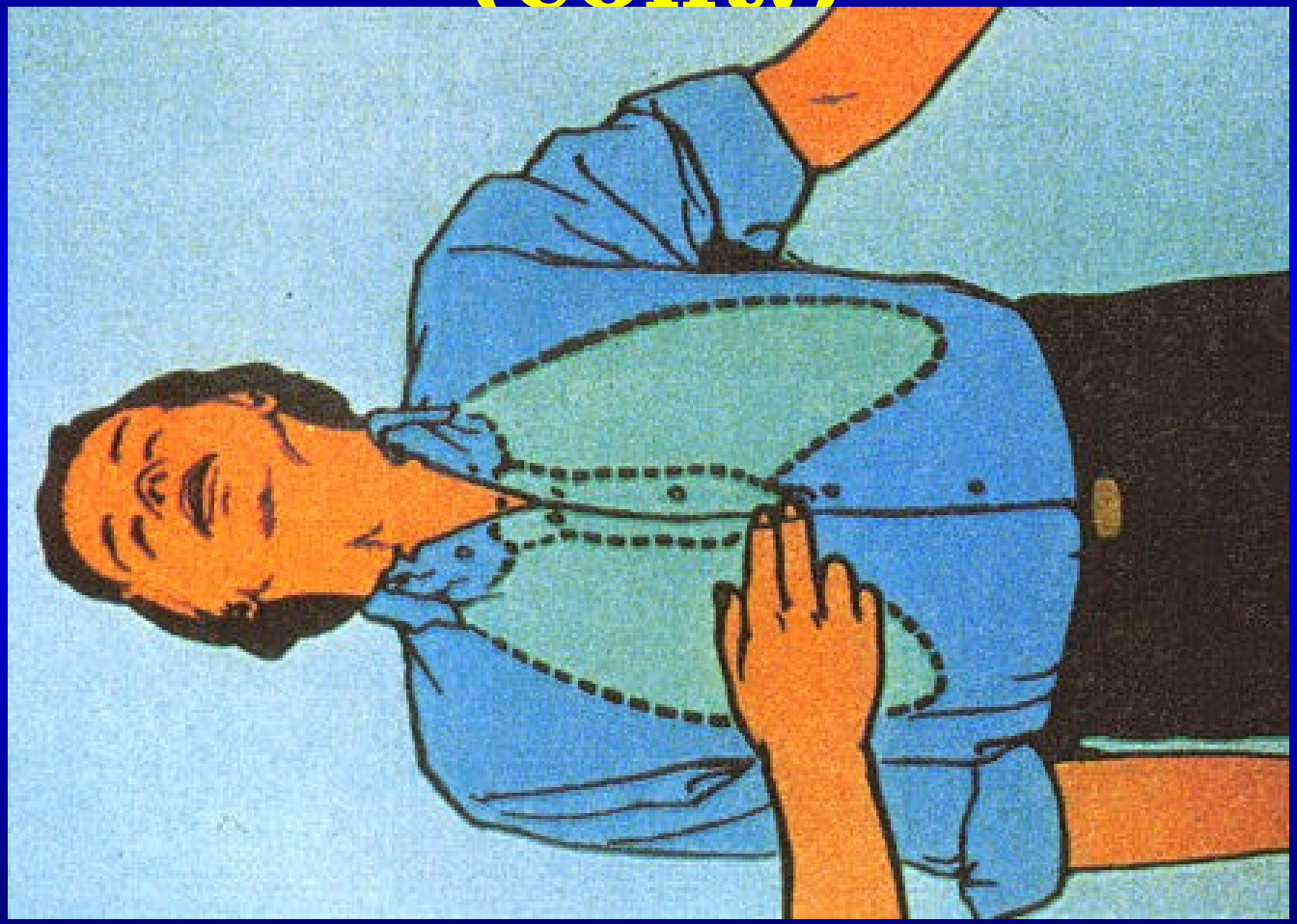
Xiphoid process
(Tip of the Sternum)

Diaphragm

Locating Hand Position for Chest Compressions

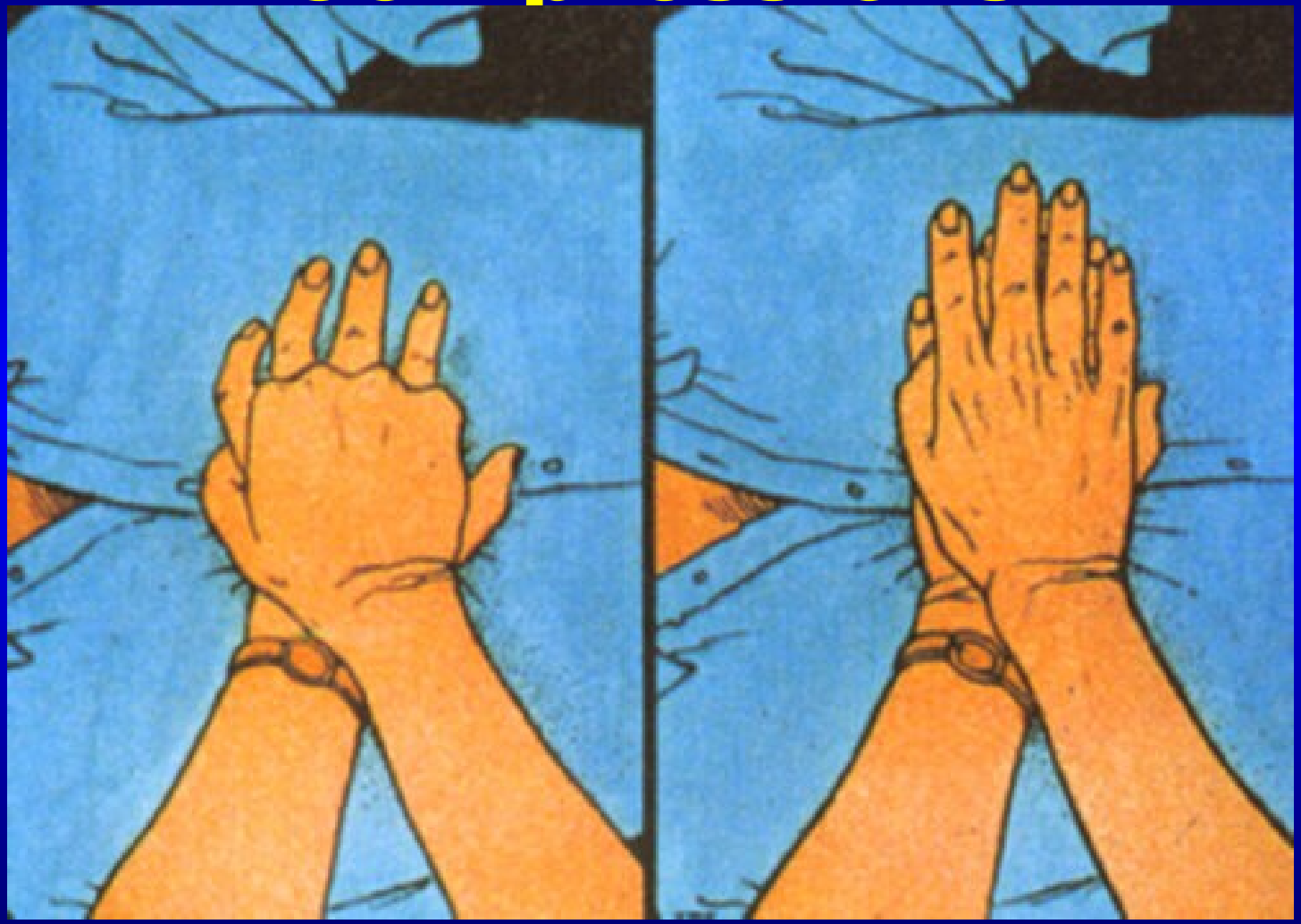


Locating Hand Position for Chest Compressions (cont.)

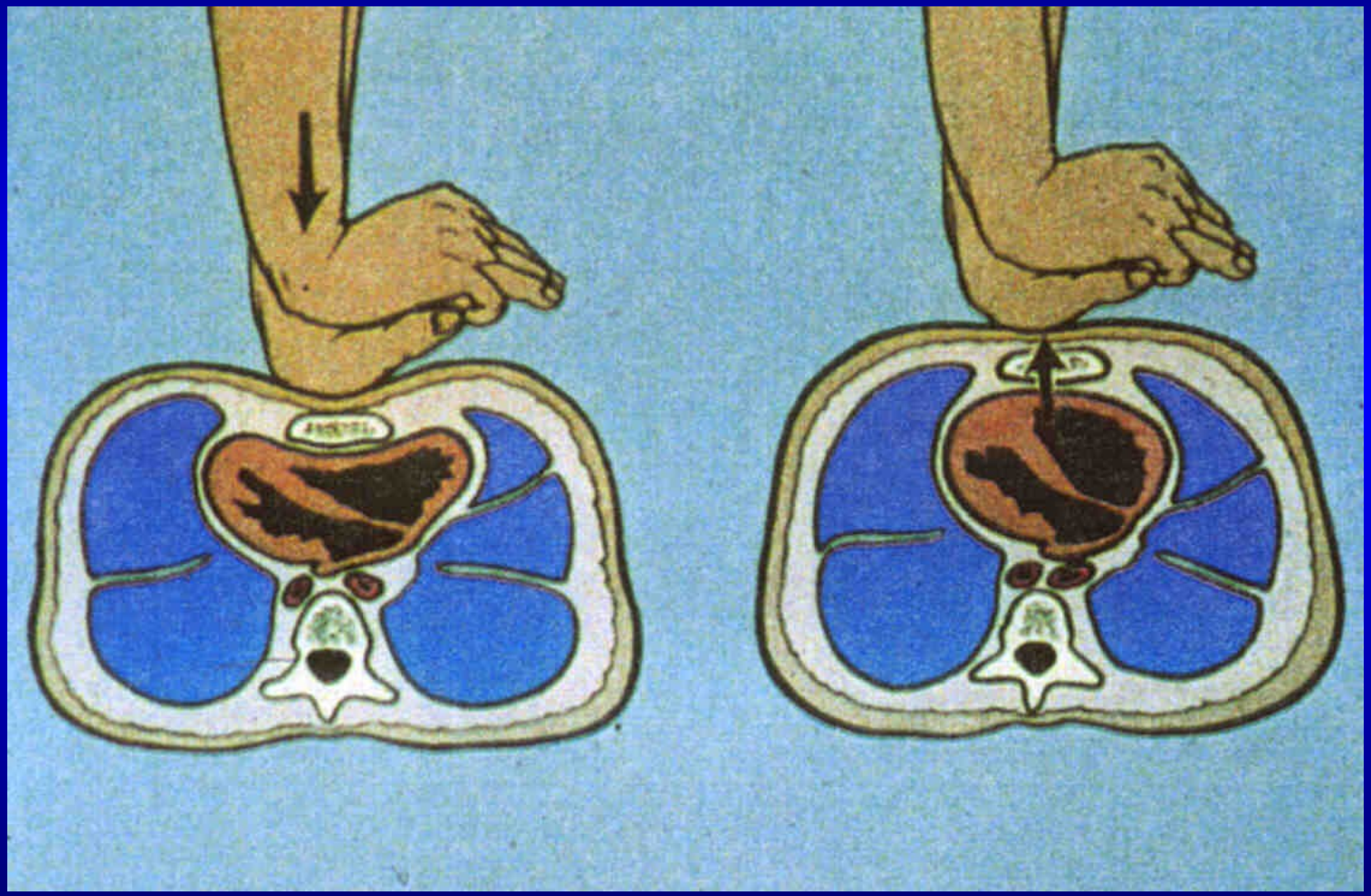


Locating Hand Position for Chest Compressions (cont.)

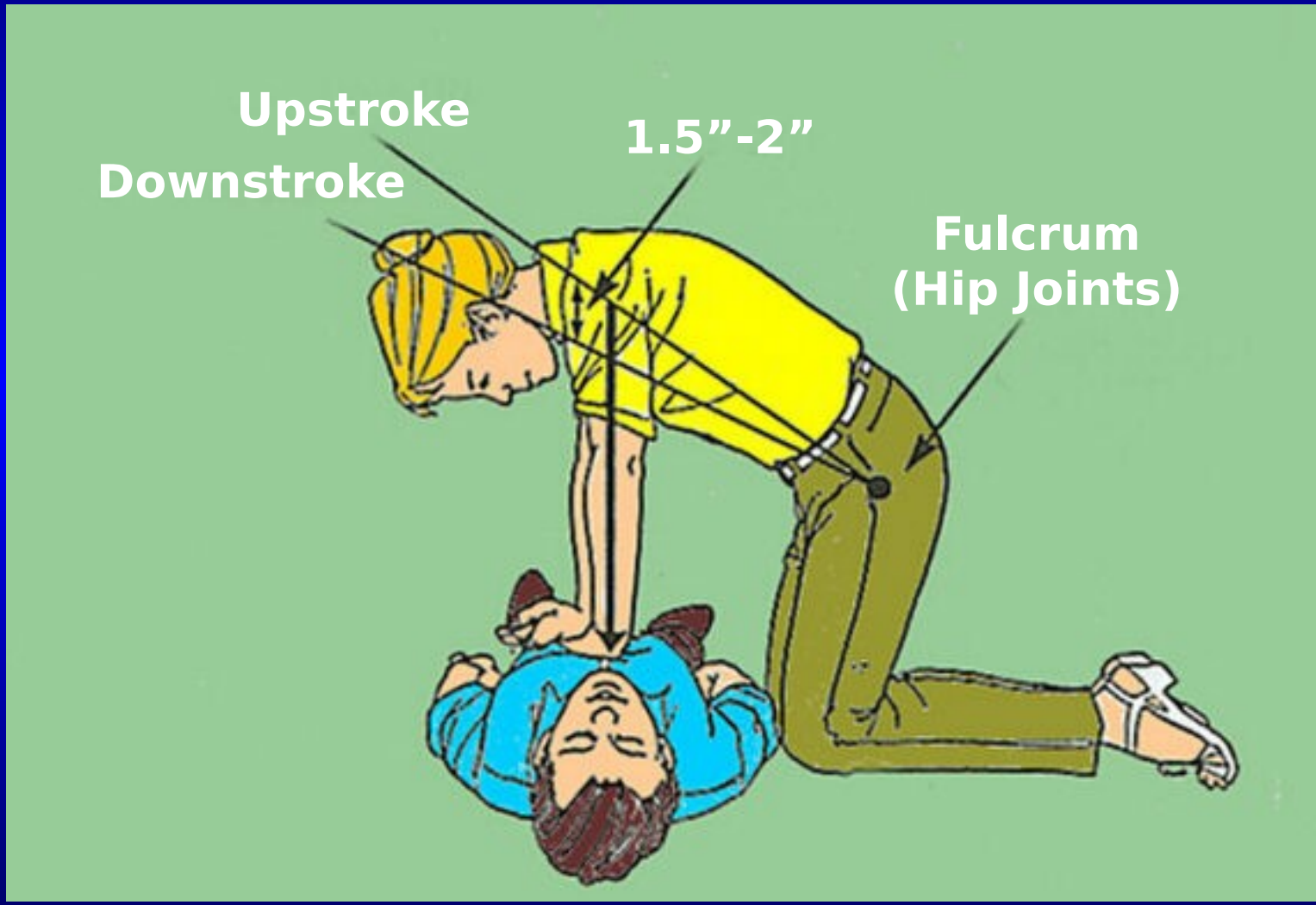
Hands on Chest for Compressions



Chest Compressions
Depress 1.5 to 2 inches



Chest Compressions



ADULT CPR

- **LANDMARKS:**
  LOWER HALF OF STERNUM
- **DEPTH OF COMPRESSIONS:**
  1 1/2 - 2 INCHES
- **COMPRESSION RATIO:**
  MINIMUM OF 100 PER MINUTE
- **COMPRESS/VENTILATION RATIO:**
  15:2 ONE PERSON CPR
  15:2 TWO PERSON CPR

CPR MINUTE

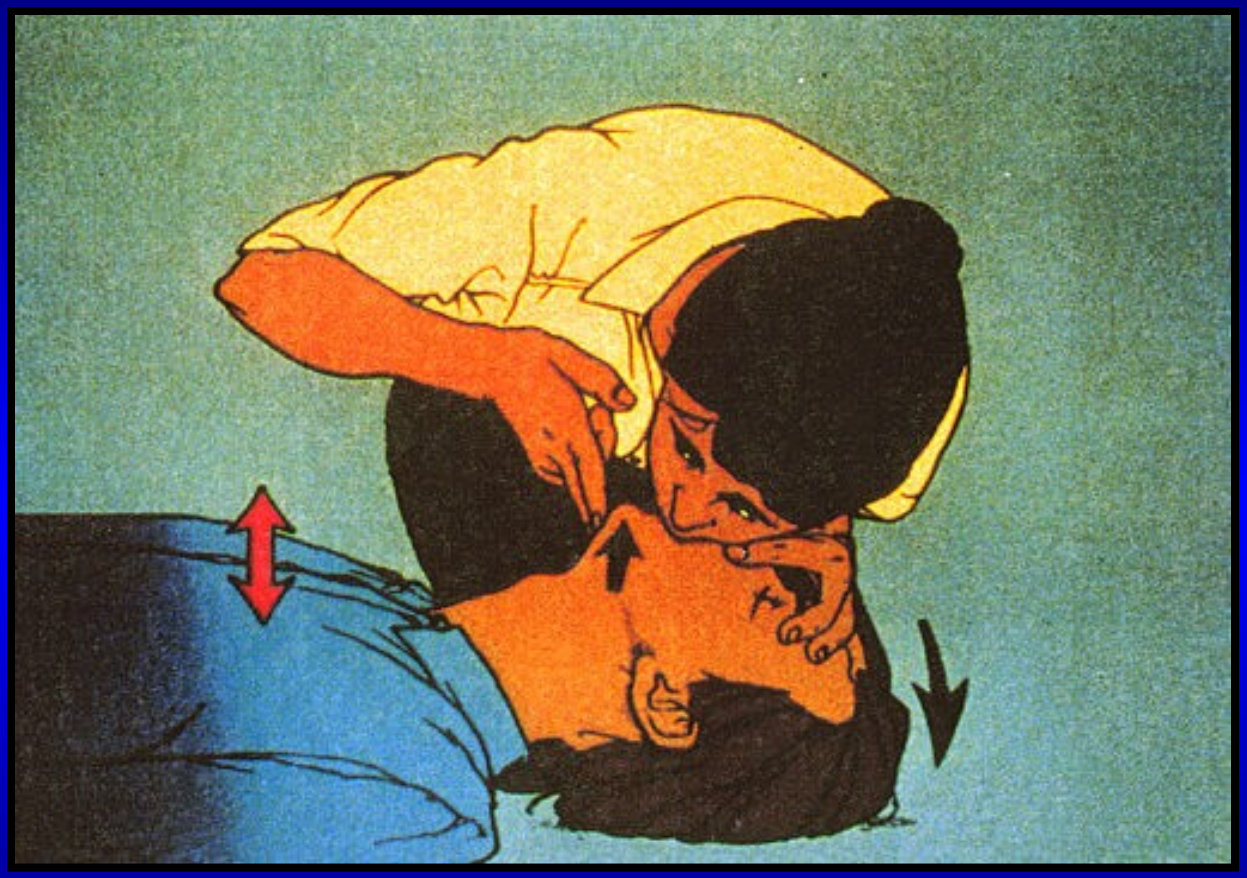
ONE PERSON CPR

4 COMPLETE CYCLES OF 15 COMPRESSIONS TO 2 BREATHS

TWO PERSON CPR

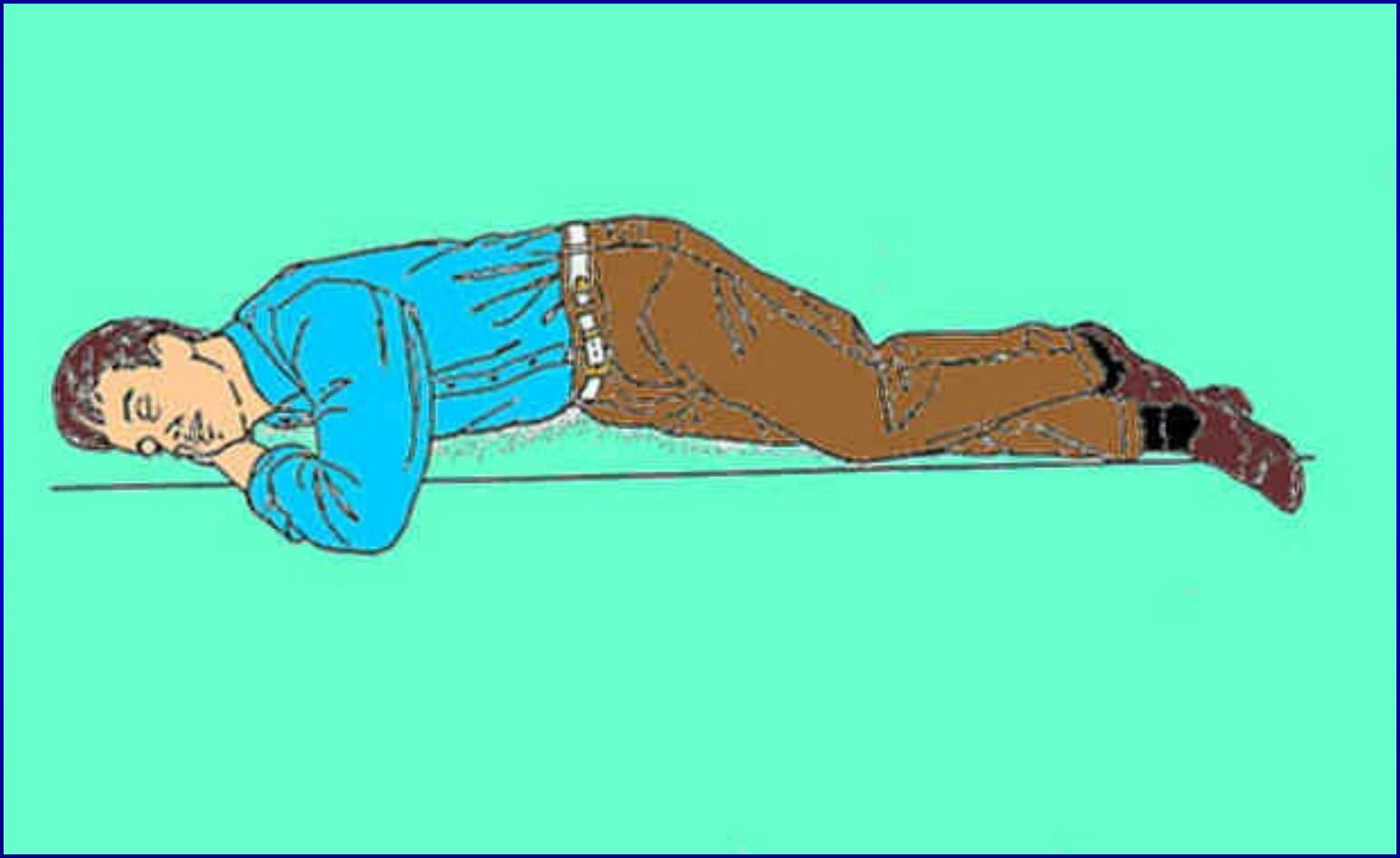
4 COMPLETE CYCLES OF 15 COMPRESSIONS TO 2 BREATHS

Adult Rescue Breathing



- **10 -12 BREATHS PER MINUTE (ONE EVERY 5 SECONDS)**

Recovery Position

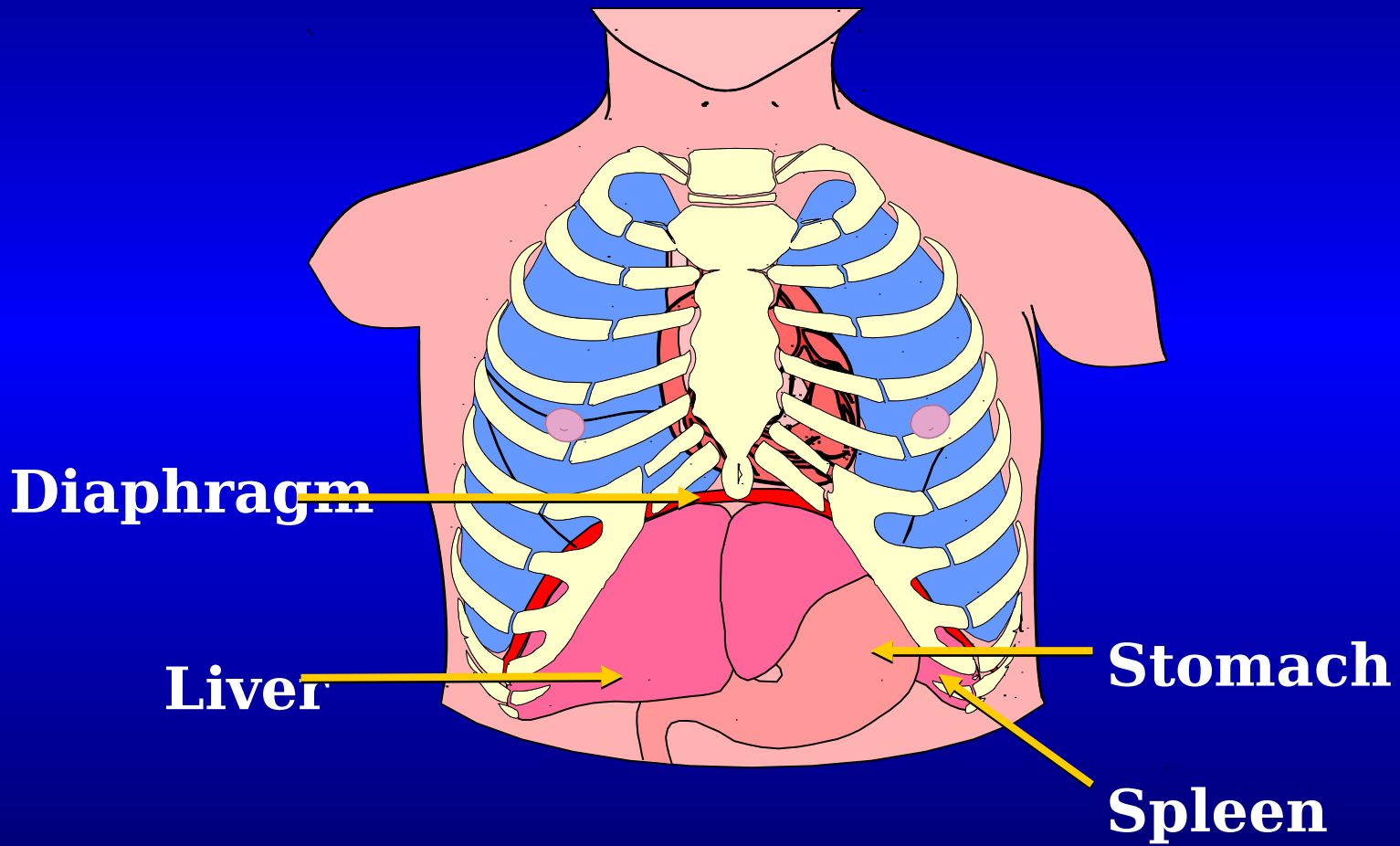


Two Person CPR

DEMONSTRATION

- ONE RESCUER CPR
- TWO RESCUER CPR

Risk Factors Associated with CPR



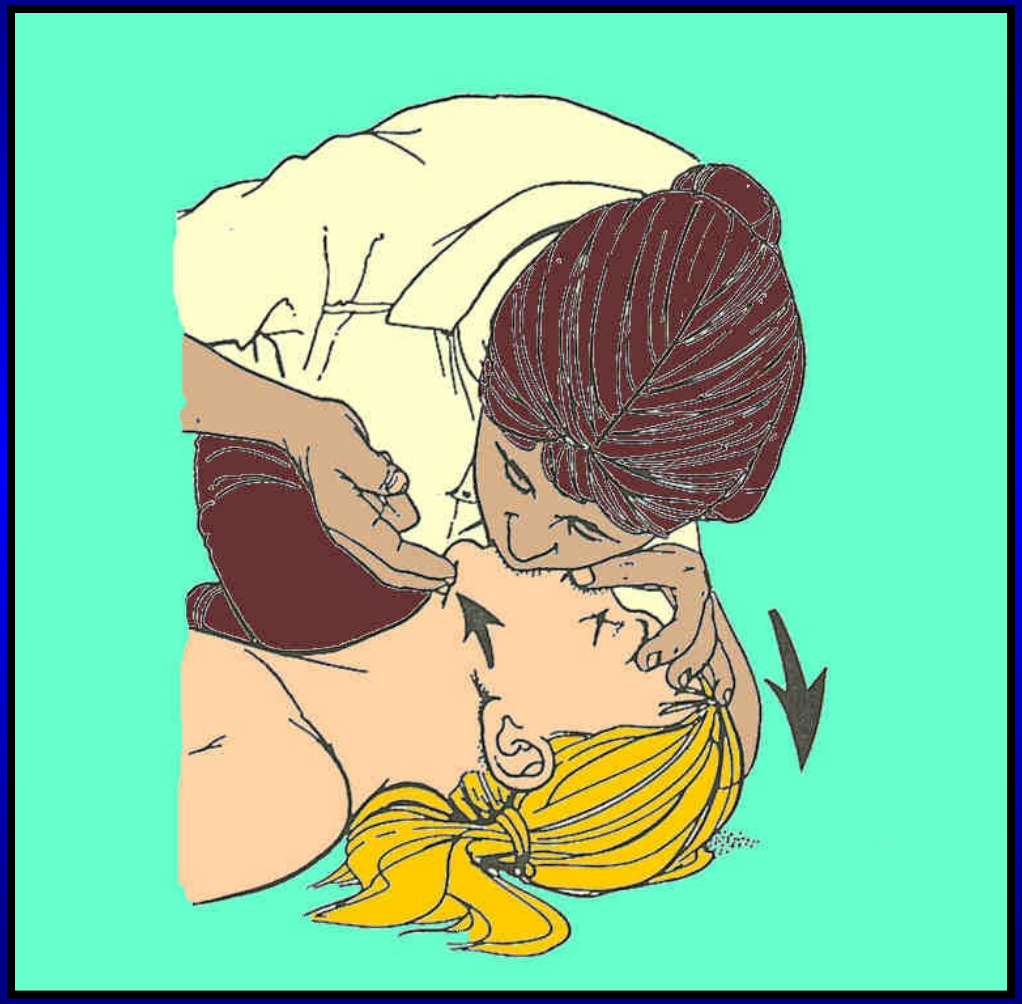
CHILD CPR

- DETERMINE UNRESPONSIVENESS
- POSITION THE VICTIM
- OPEN THE AIRWAY
- DETERMINE BREATHLESSNESS
- GIVE 2 RESCUE BREATHS

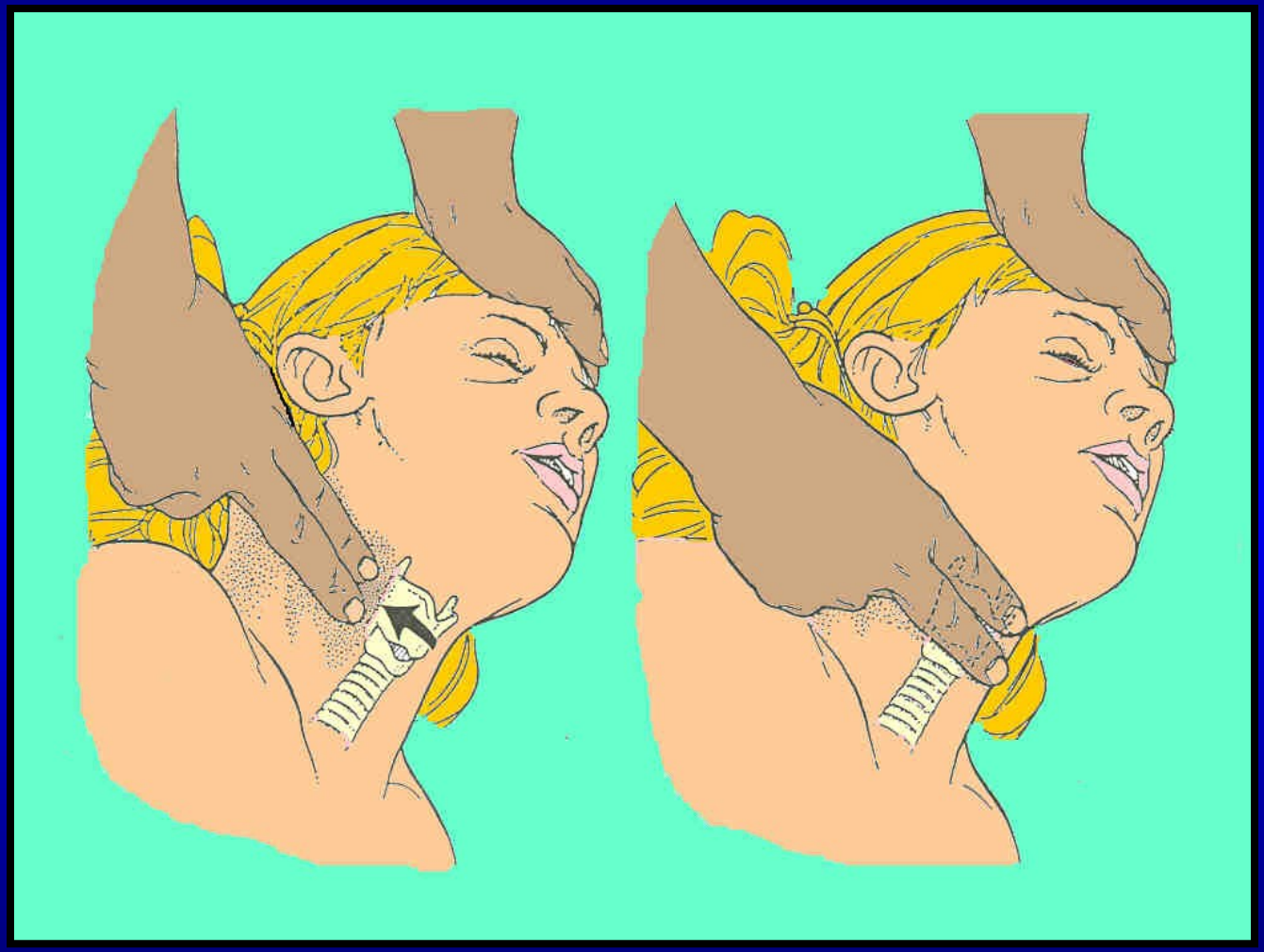
CHILD CPR (con't)

- CHECK CIRCULATION - DOES THE VICTIM HAVE A PULSE?
- PERFORM CHEST COMPRESSIONS
- ACTIVATE EMS AFTER APPROXIMATELY ONE MINUTE OF CPR OR RESCUE BREATHING

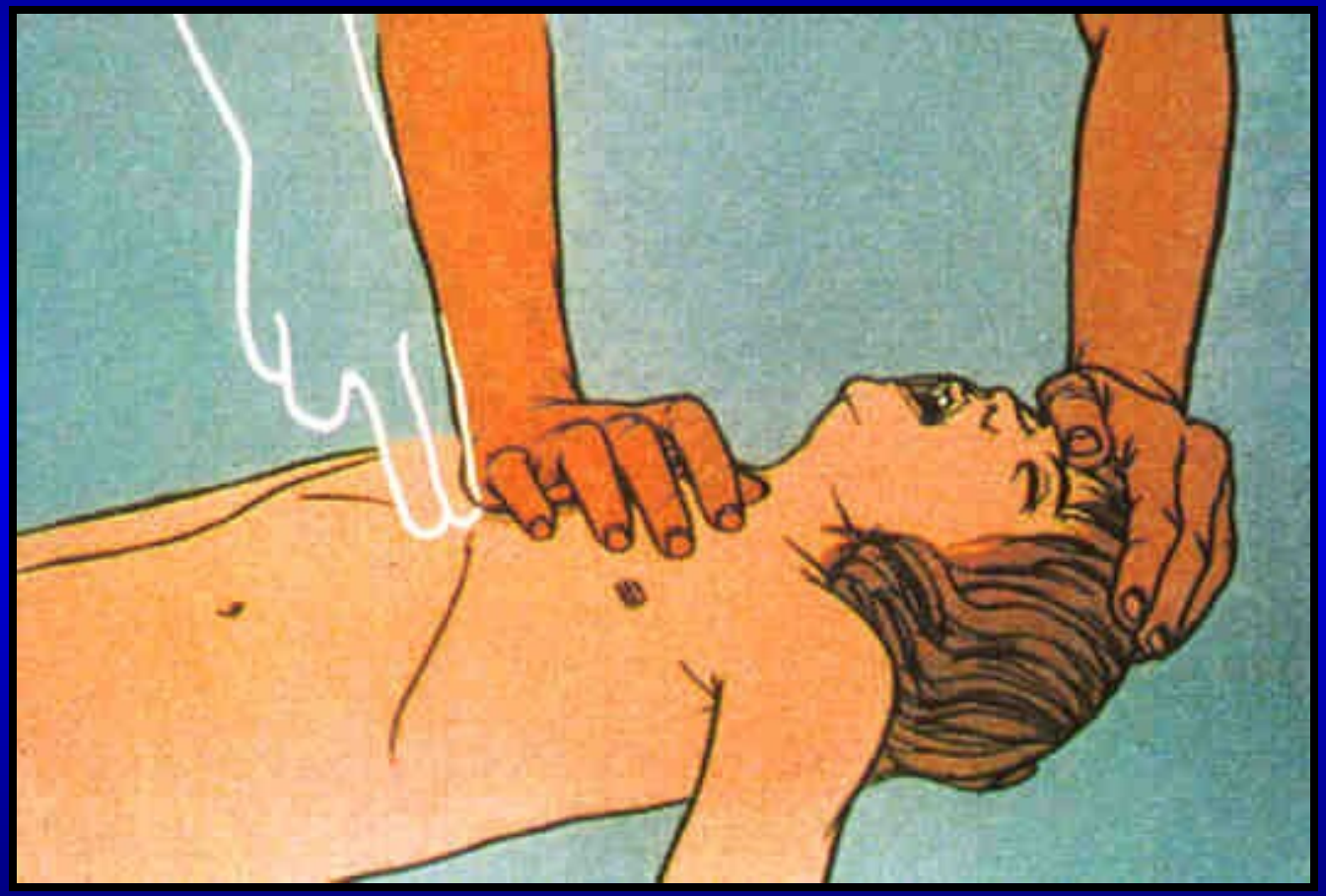
Rescue Breaths



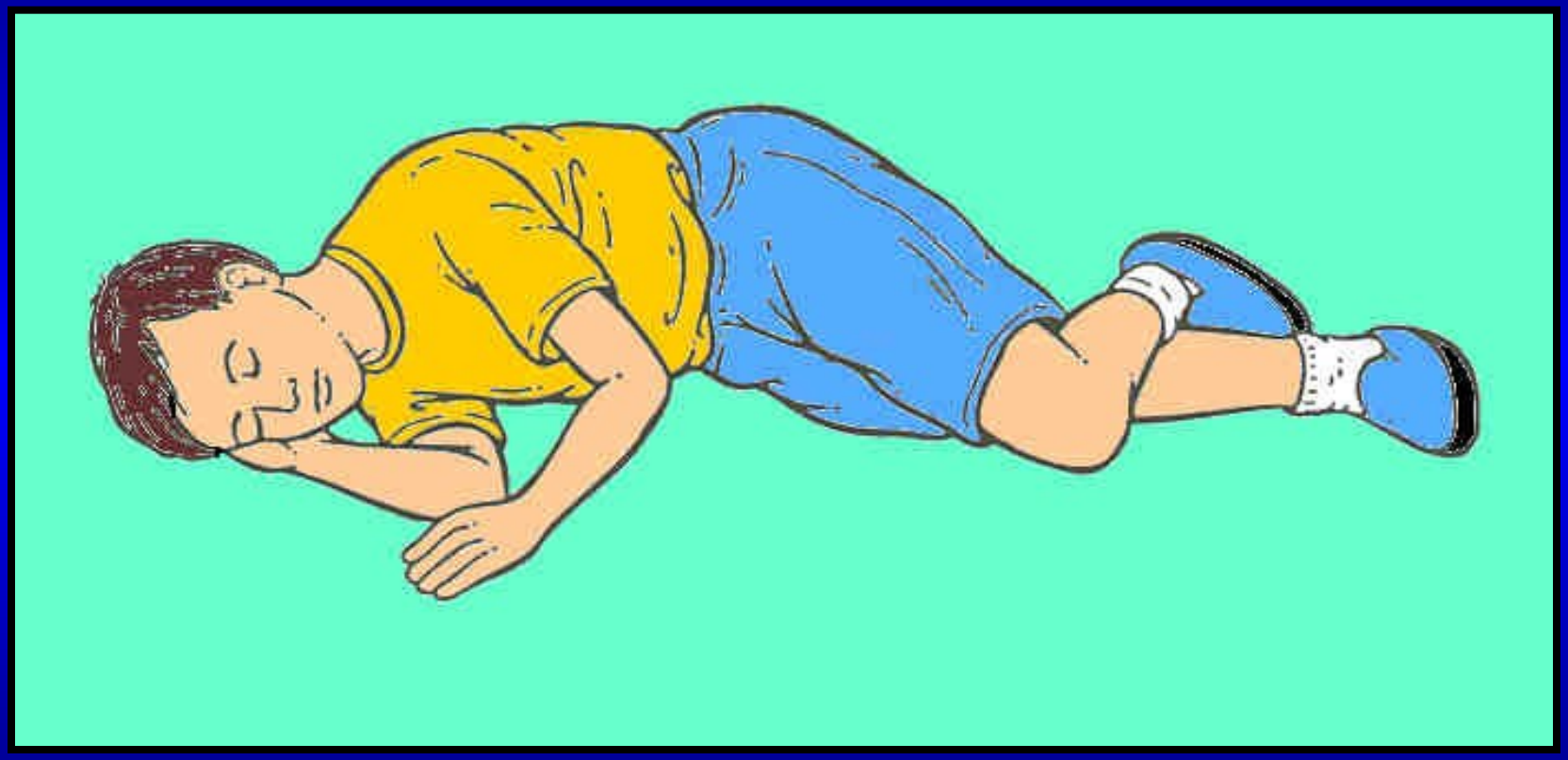
Check Carotid Pulse



Locating Hand Position for Chest Compressions



Recovery Position



CHILD CPR

- **LANDMARK:**
  LOWER HALF OF STERNUM
- **DEPTH OF COMPRESSIONS:**
  1 -1 1/2 INCHES
- **COMPRESSION/VENTILATION RATO:**
  5:1
- **RESCUE BREATHING:**
  20 BREATHS/MIN
  (ONE EVERY 3 SECONDS)

CPR MINUTE

20 COMPLETE CYCLES OF

5 COMPRESSIONS TO

ONE

BREATH FOR ONE

RESCUER

AND TWO RESCUER CPR

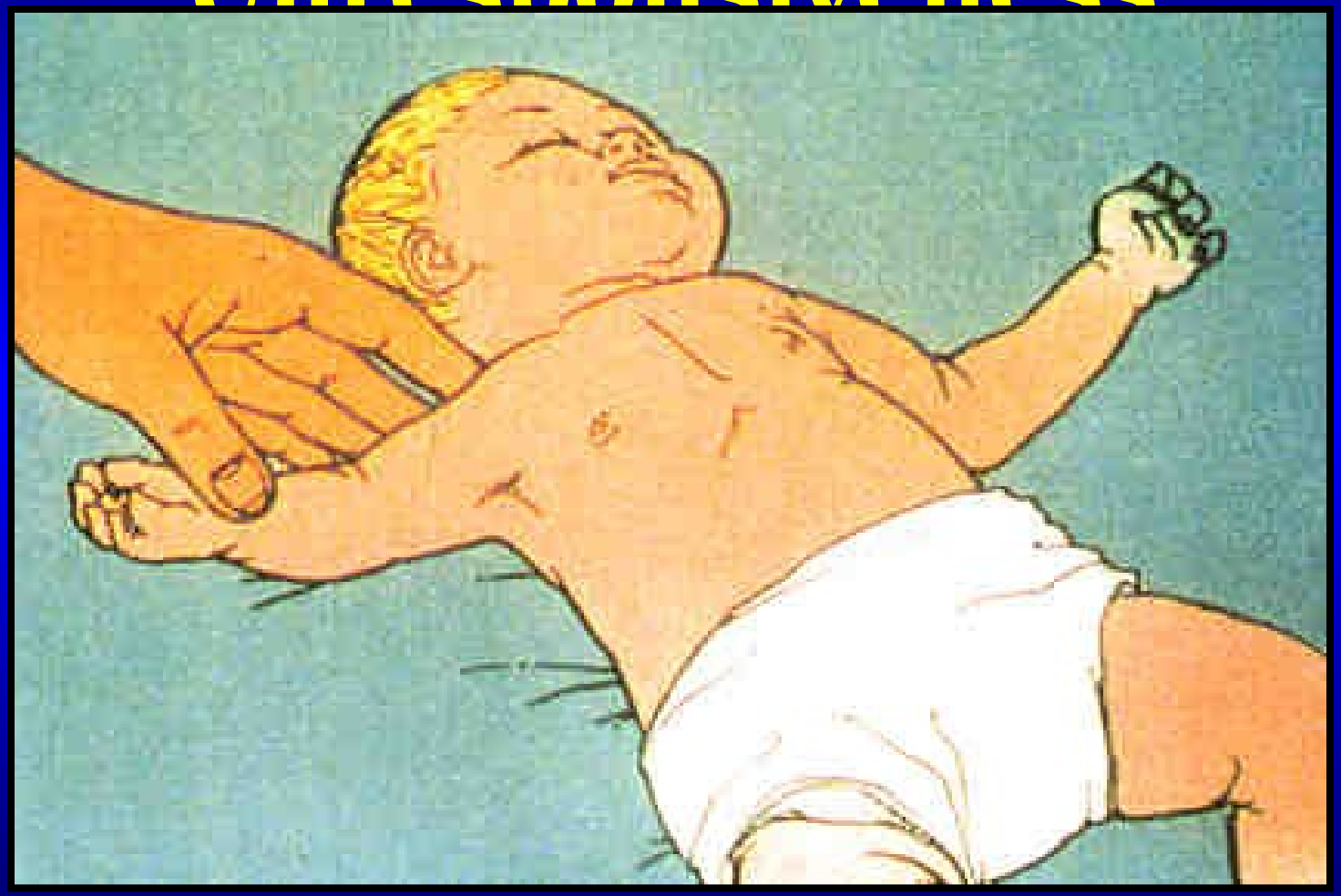
INFANT CPR

- DETERMINE UNRESPONSIVENESS
- POSITION THE VICTIM
- OPEN THE AIRWAY
- DETERMINE BREATHLESSNESS
- GIVE 2 RESCUE BREATHS

INFANT CPR

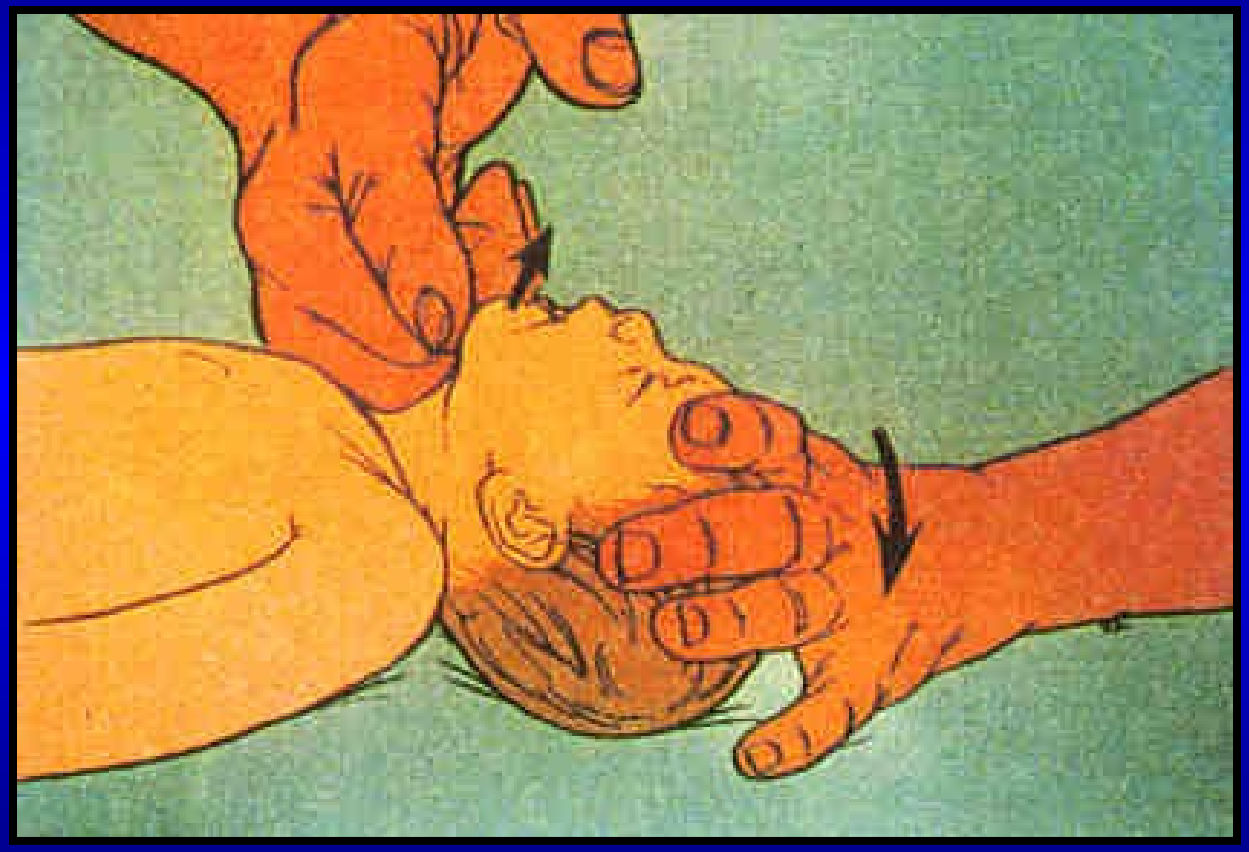
- CHECK CIRCULATION - DOES THE VICTIM HAVE A PULSE?
- PERFORM CHEST COMPRESSIONS
- ACTIVATE EMS AFTER APPROXIMATELY ONE MINUTE OF CPR OR RESCUE BREATHING

Assessment: Determine Unresponsiveness



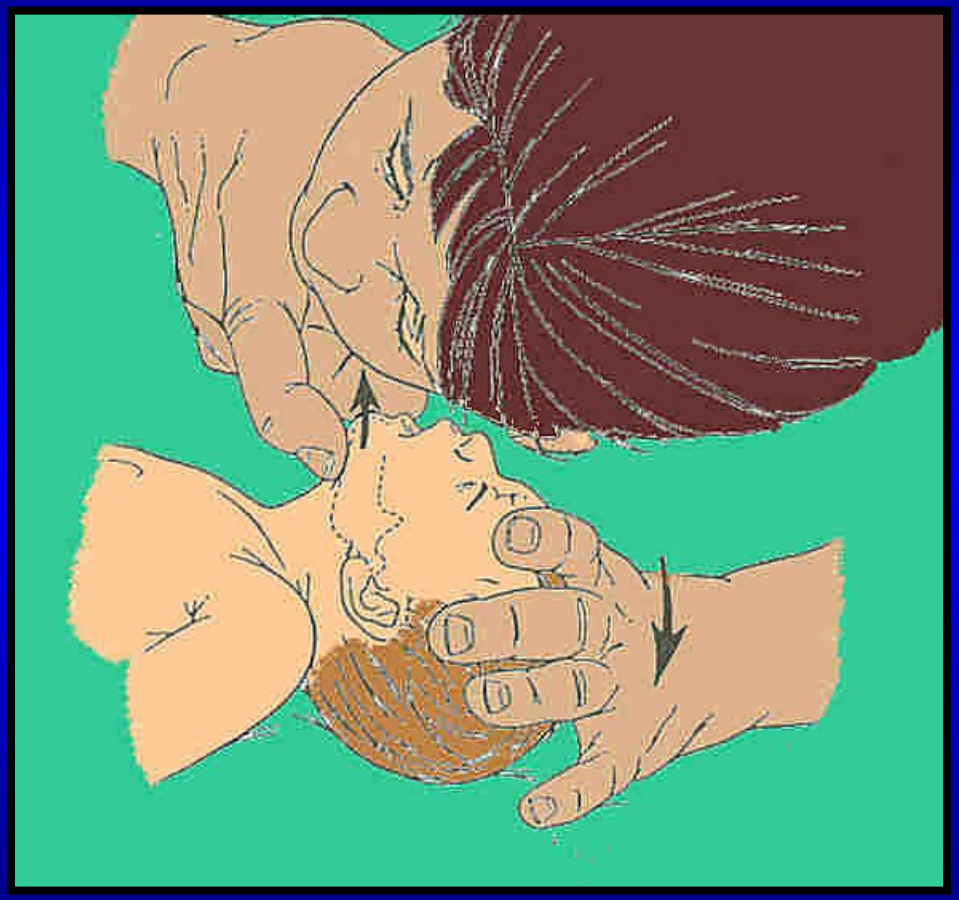
Call for Help: Position the Victim

Open the Airway: Head Tilt-Chin Lift



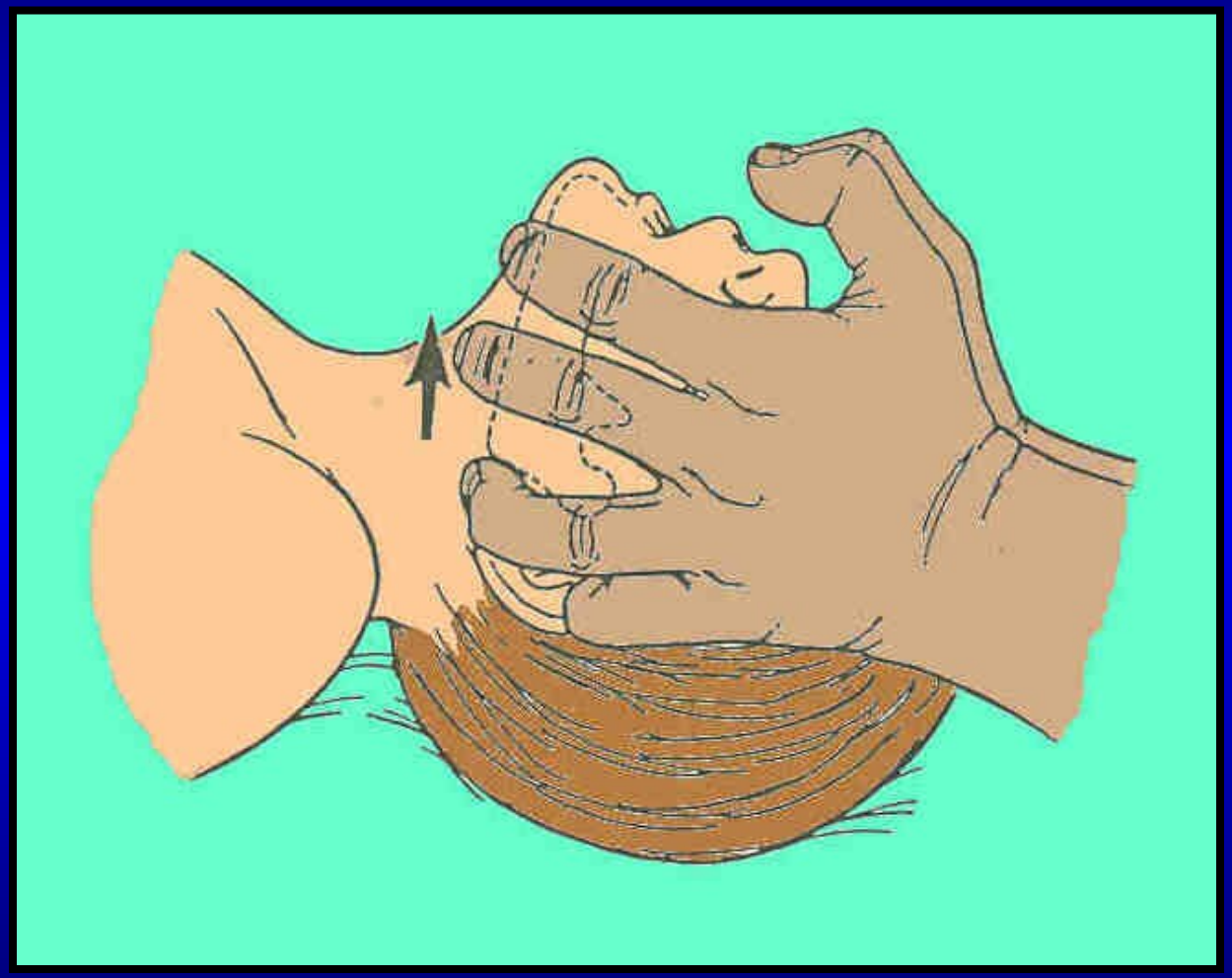
- **SNIFFING POSITION**

Assessment: Determine Breathlessness

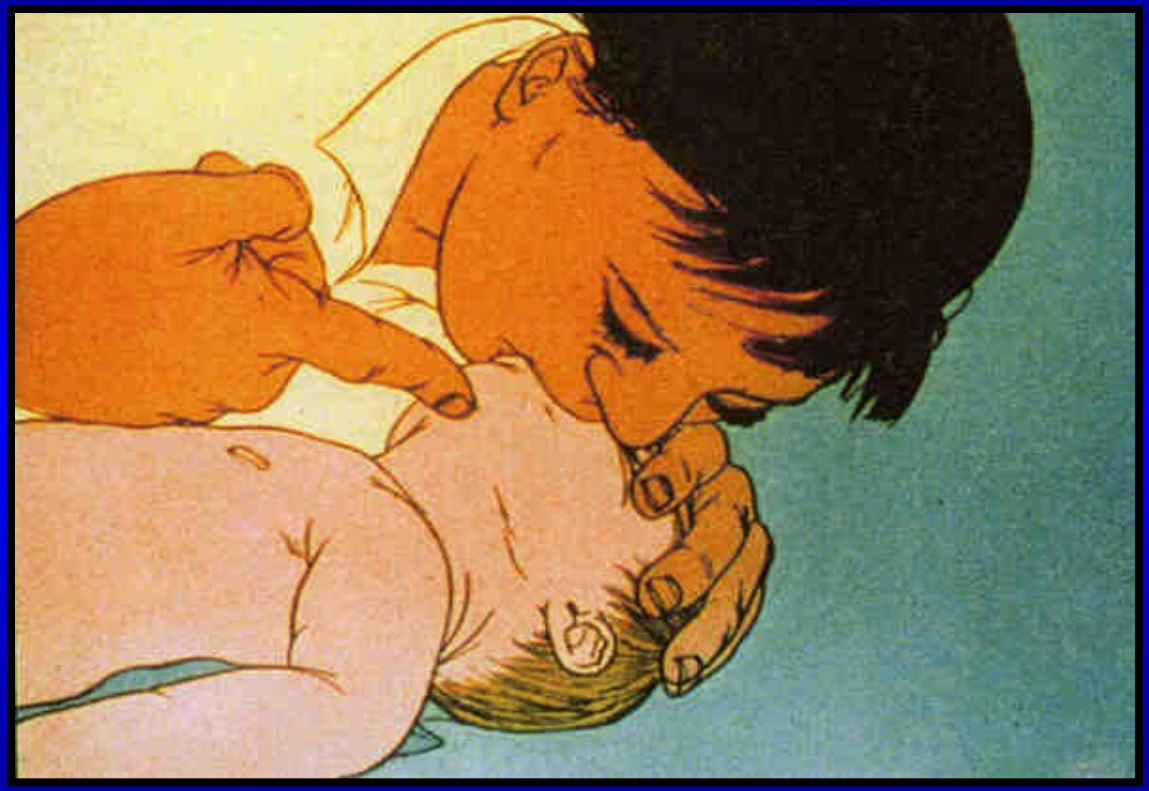


FOR 3-5 SECONDS

Infant Jaw Thrust

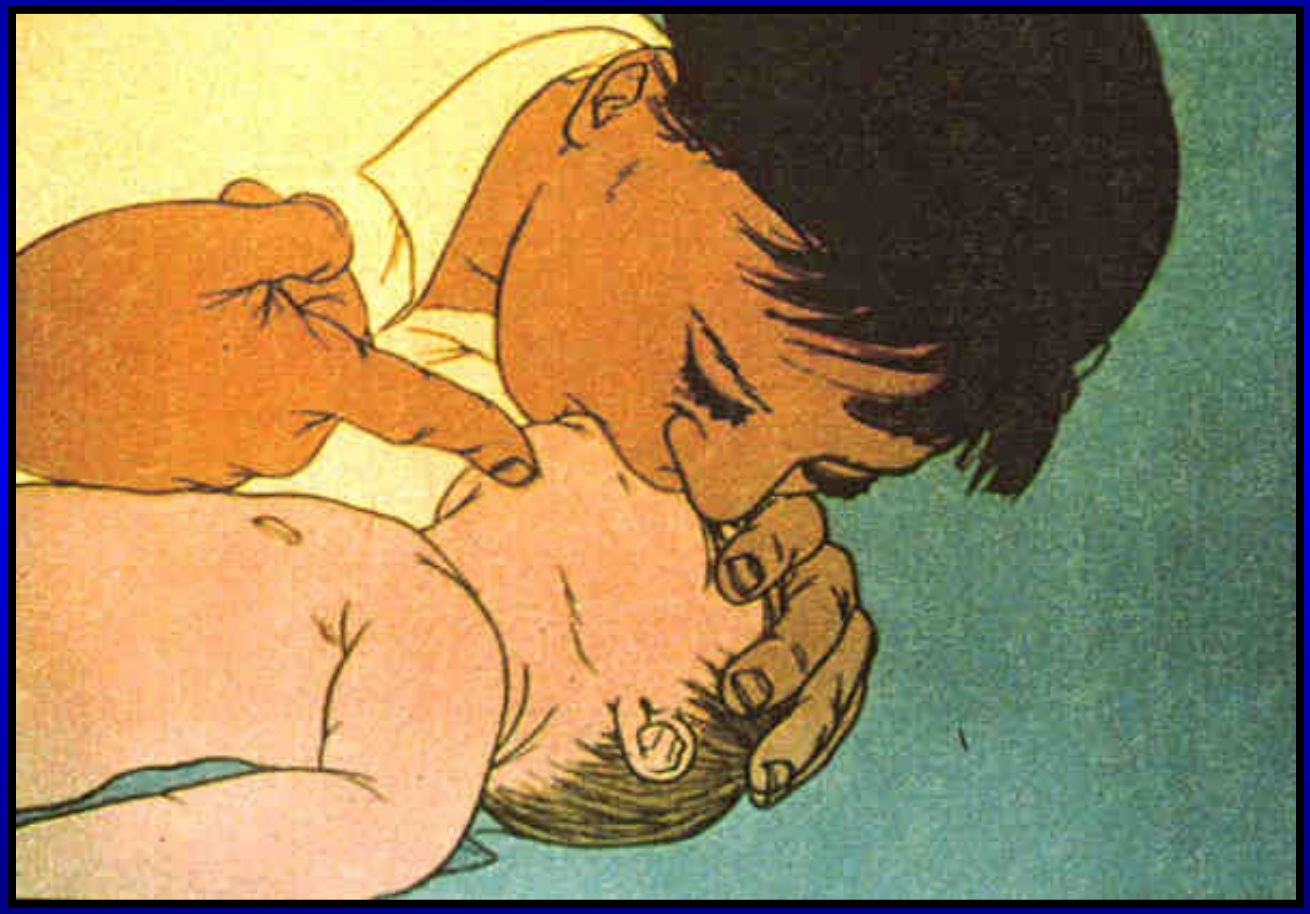


Mouth-to-Mouth Rescue Breathing

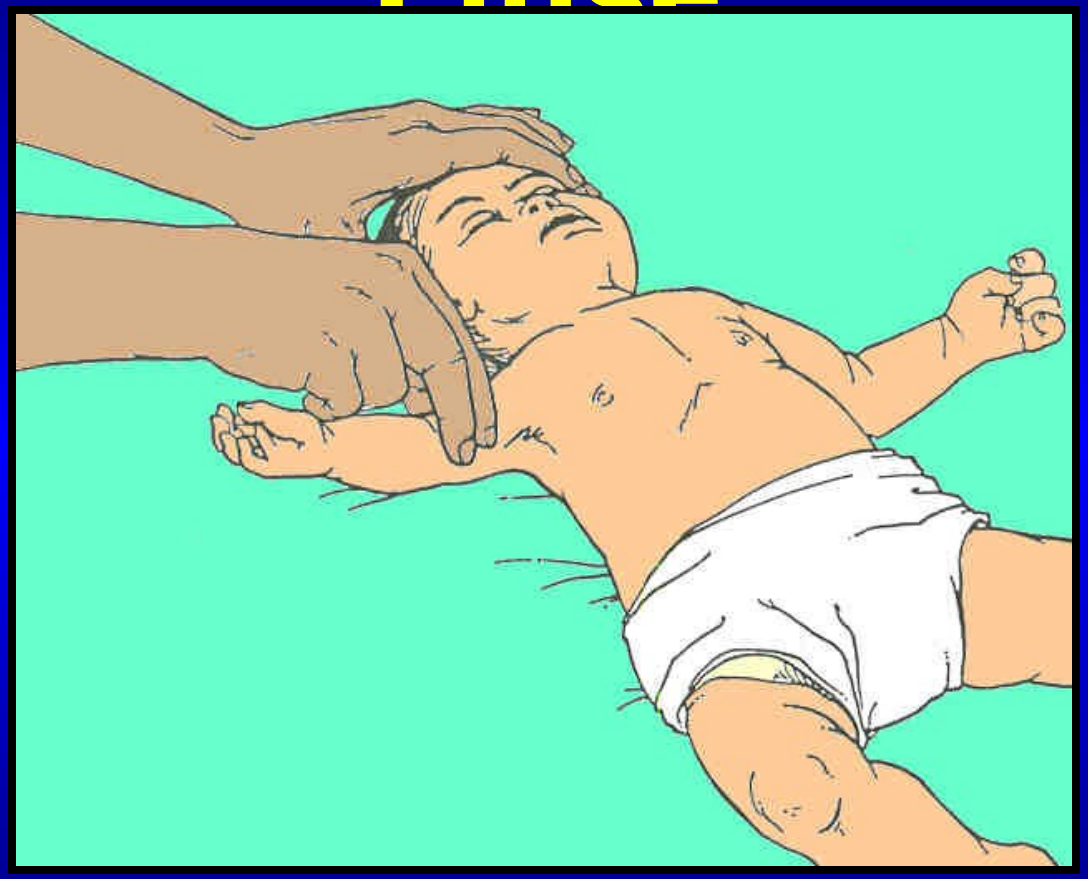


PLACE MOUTH OVER THE INFANT VICTIMS NOSE AND MOUTH

Head Tilt-Chin Lift During Ventilation

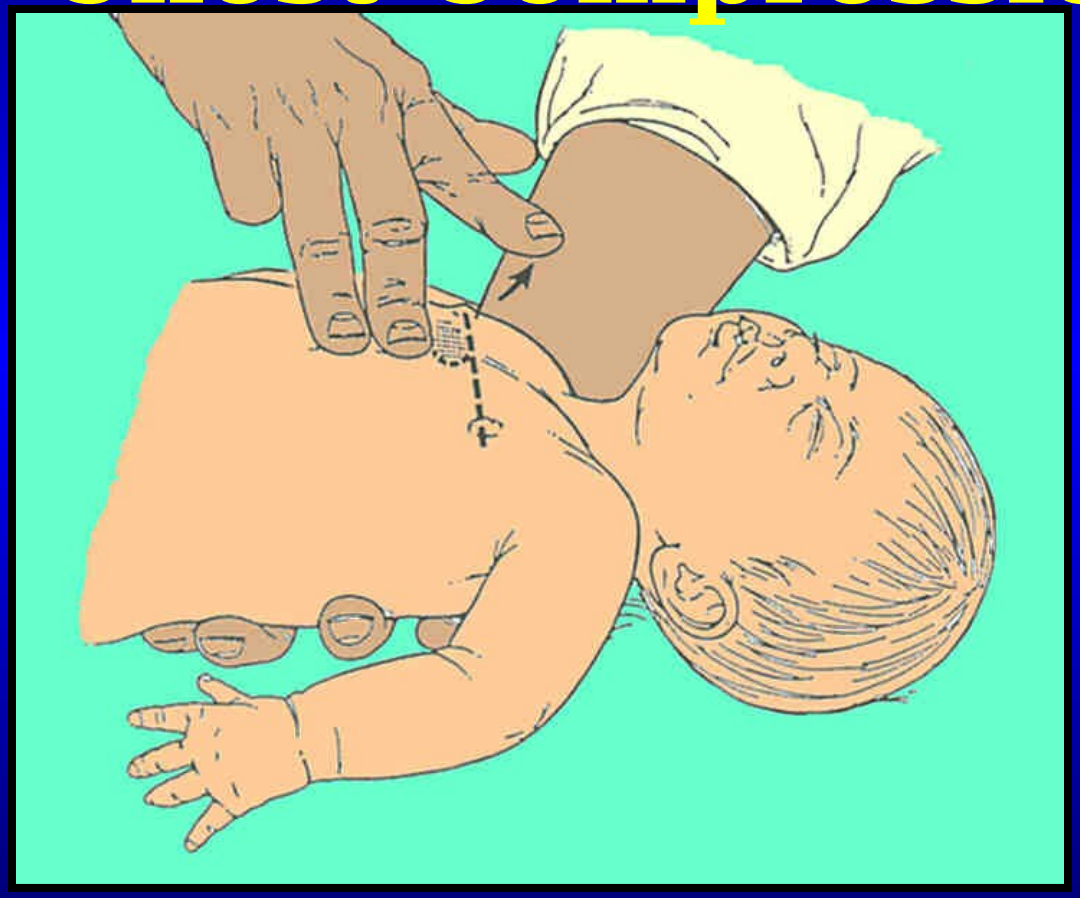


Check the Brachial Pulse

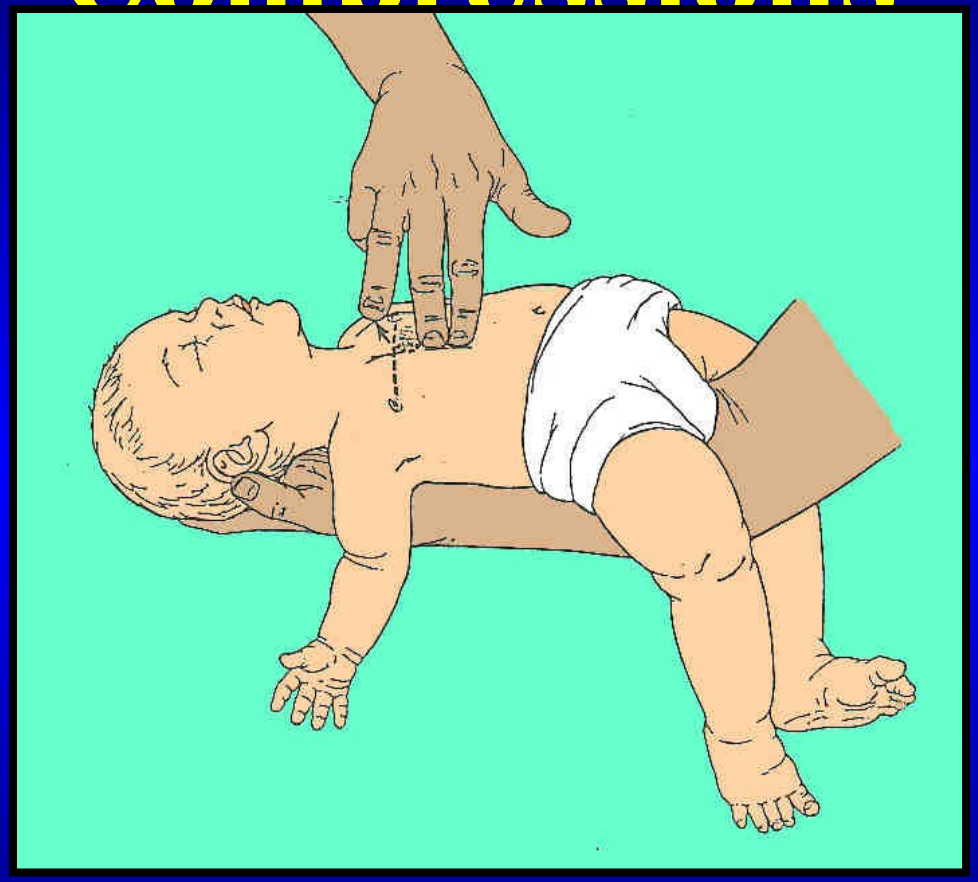


FOR 5-10 SECONDS

Position Finger on Sternum for Chest Compressions



Infant Chest Compressions



COMPRESSION DEPTH: 1/2 - 1 INCH

INFANT CPR

- **LANDMARK:**
  LOWER HALF OF STERNUM
- **DEPTH OF COMPRESSIONS:**
  1/2 - 1 INCHES
- **COMPRESSION/VENTILATION RATO:**
  5:1
- **RESCUE BREATHING:**
  20 BREATHS/MIN
  (ONCE EVERY 3 SECONDS)

CPR MINUTE

20 COMPLETE CYCLES OF

5 COMPRESSION TO ONE

BREATH

DEMONSTRATION OF CHILD CPR

DEMONSTRATION OF INFANT CPR

RELIEF OF FOREIGN BODY AIRWAY OBSTRUCTION (FBAO)

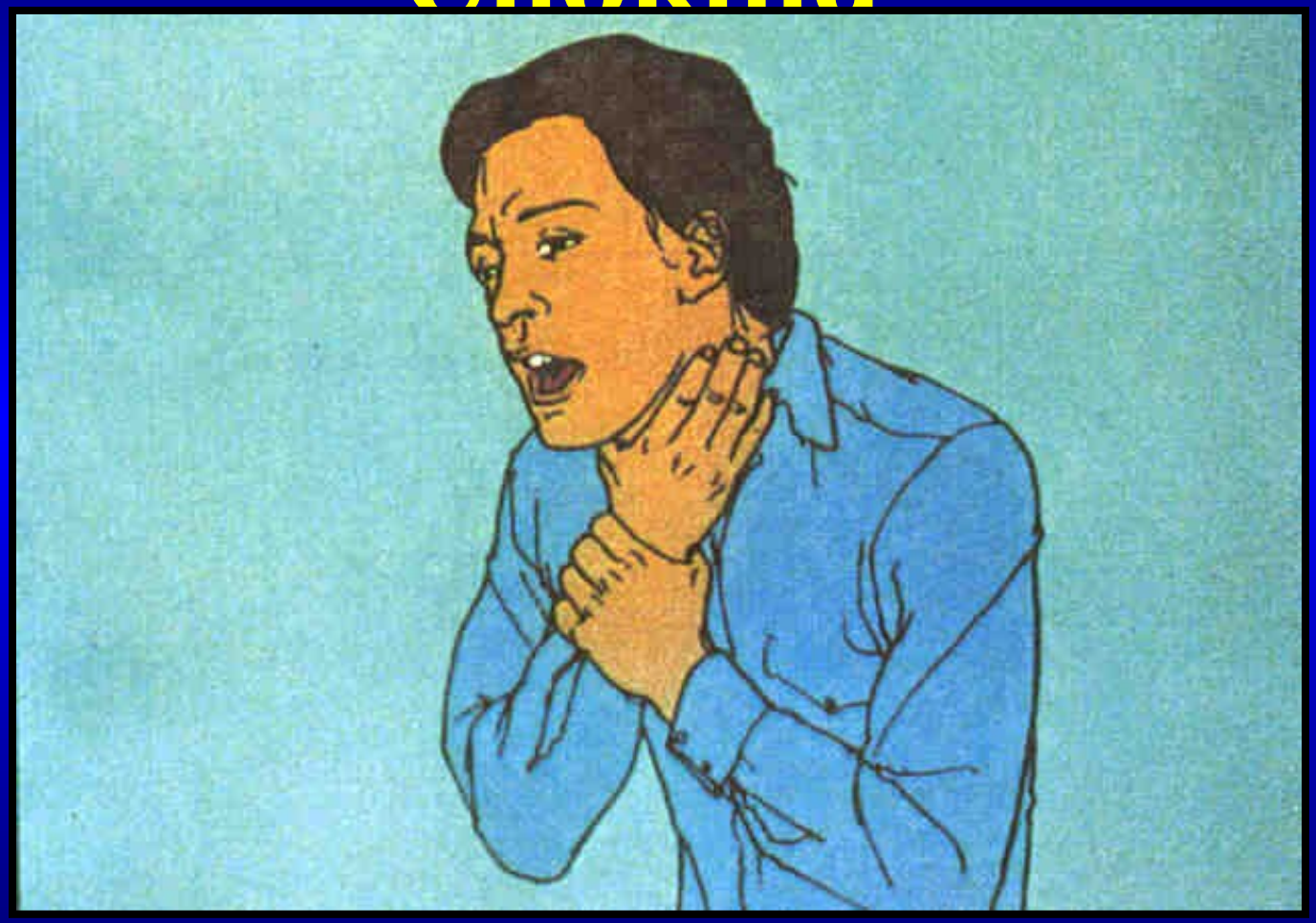
- ADULT
  - INCIDENCE
  - CAUSES
  - PREVENTION

ADULT FBAO

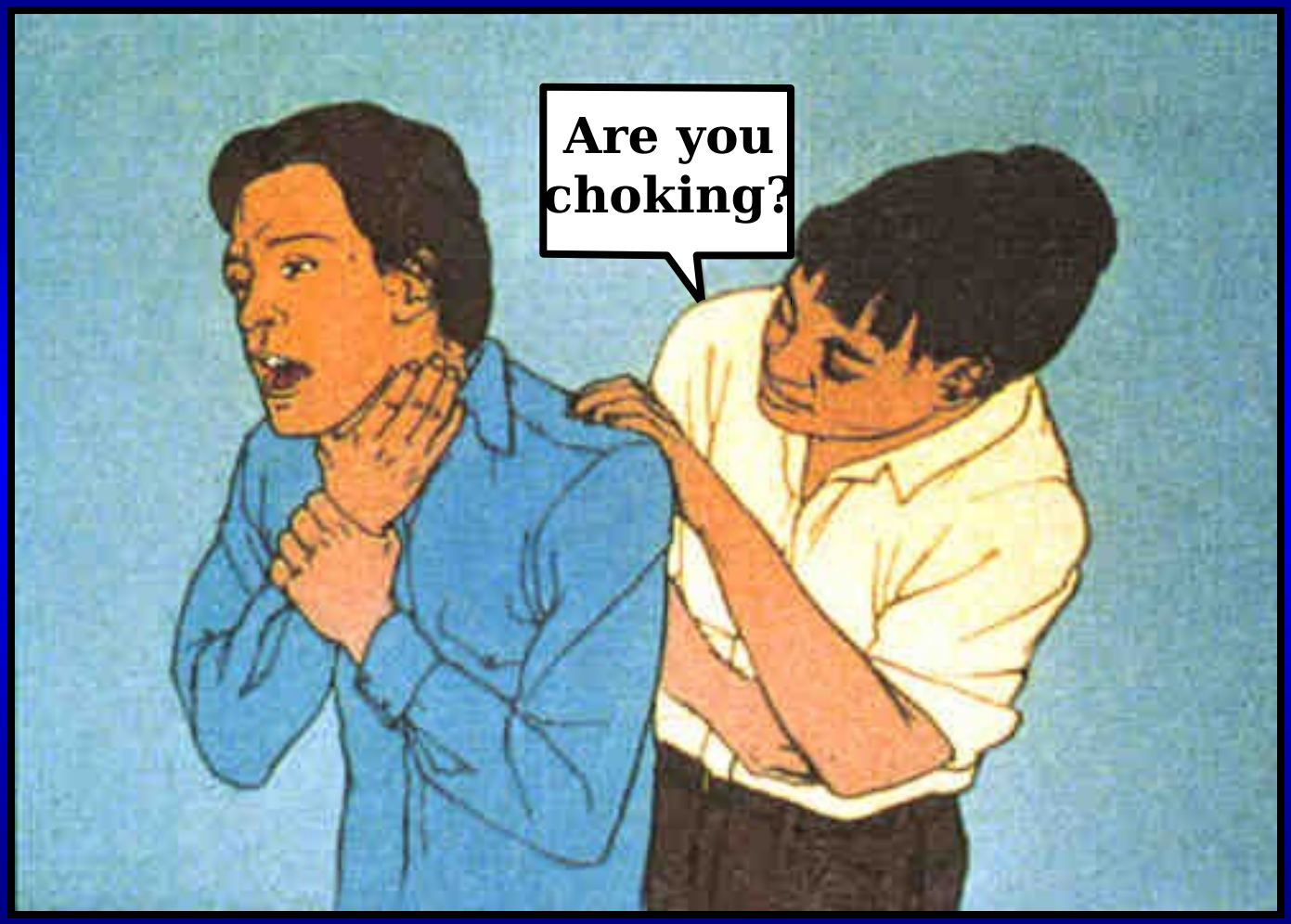
- **PARTIAL AIRWAY OBSTRUCTION**
  - **POOR AIR EXCHANG**
  - **GOOD AIR EXCHANGE**

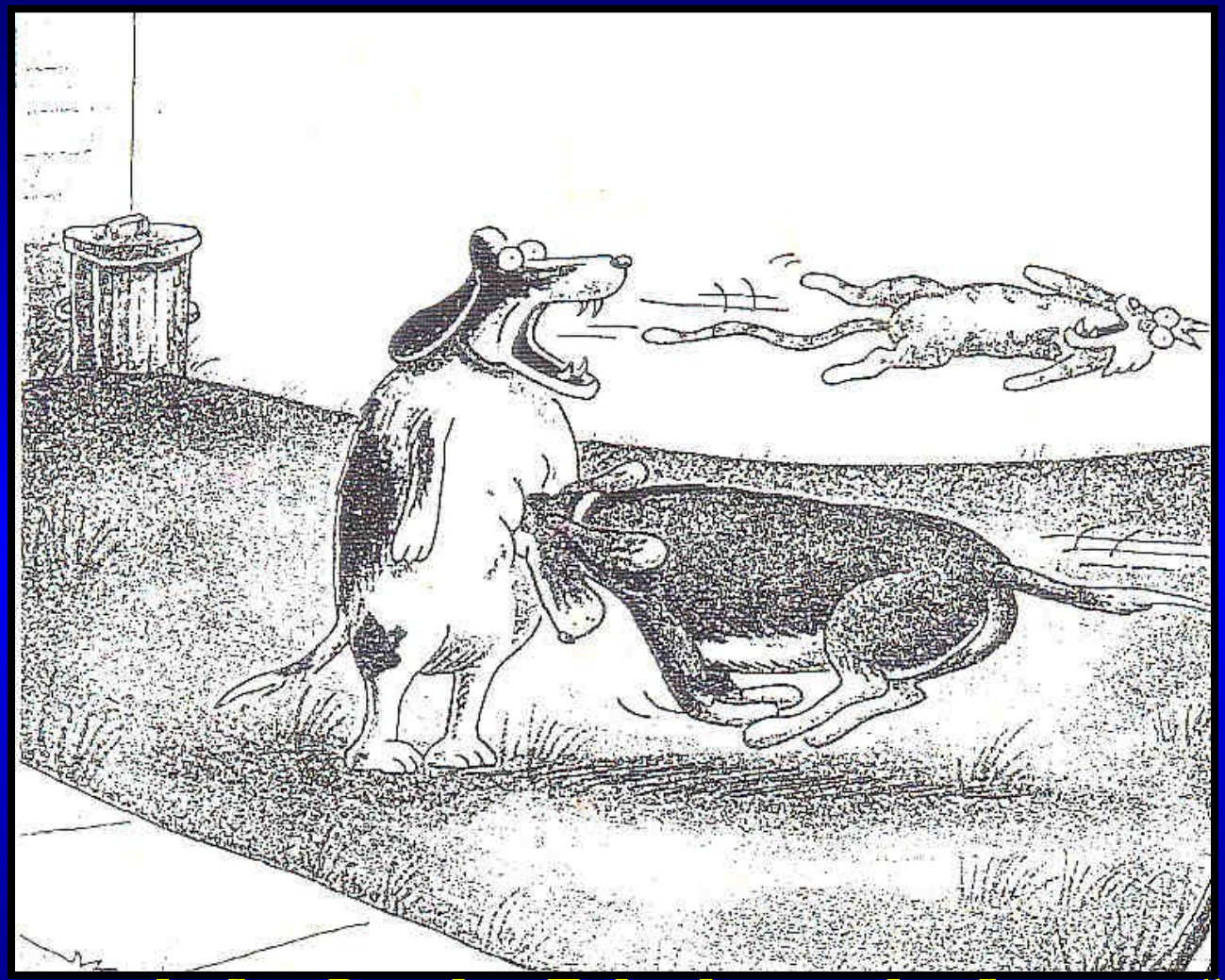
- **COMPLETE AIRWAY OBSTRUCTION**

Universal Signal for Choking



Choking Victim





Fortunately for Sparky, Zeke knew the famous “Rex maneuver”

MANEUVERS OF FBAO – ADULT

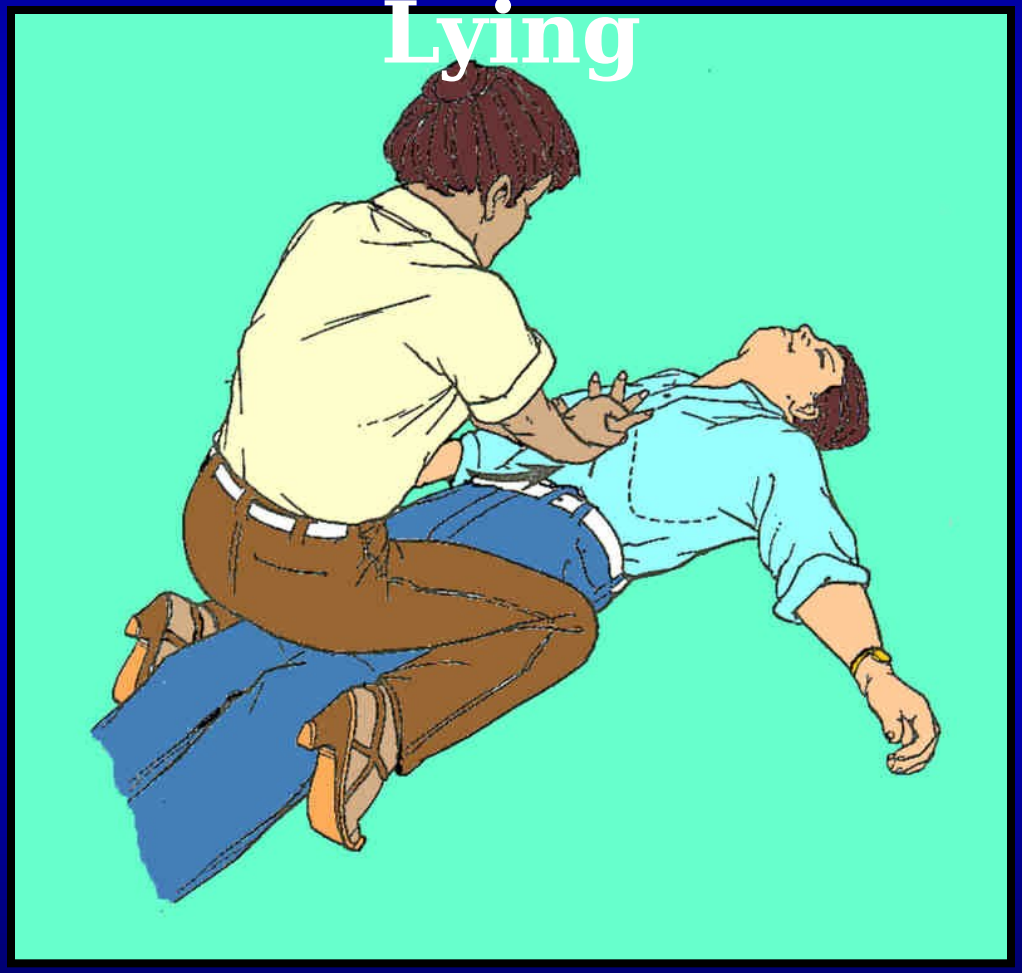
- MANUAL ABDOMINAL THRUST -
  - HEIMLICH MANUEVER
  - – VICTIM SITTING OR STANDING
  - – VICTIM LYING
  - – VICTIM ALONE (Self Administered)

Subdiaphragmatic Abdominal Thrusts

The Heimlich Maneuver: Victim Standing

Subdiaphragmatic Abdominal Thrusts

The Heimlich Maneuver: Victim Lying



SPECIAL CASES (CHEST THRUST)

- **PREGNANT VICTIM**
- **OBESE VICTIM**

Chest Thrusts in Late Pregnancy

Victim Standing

Chest Thrusts in Late Pregnancy

Victim Lying

VICTIM BECOMES UNCONSCIOUS

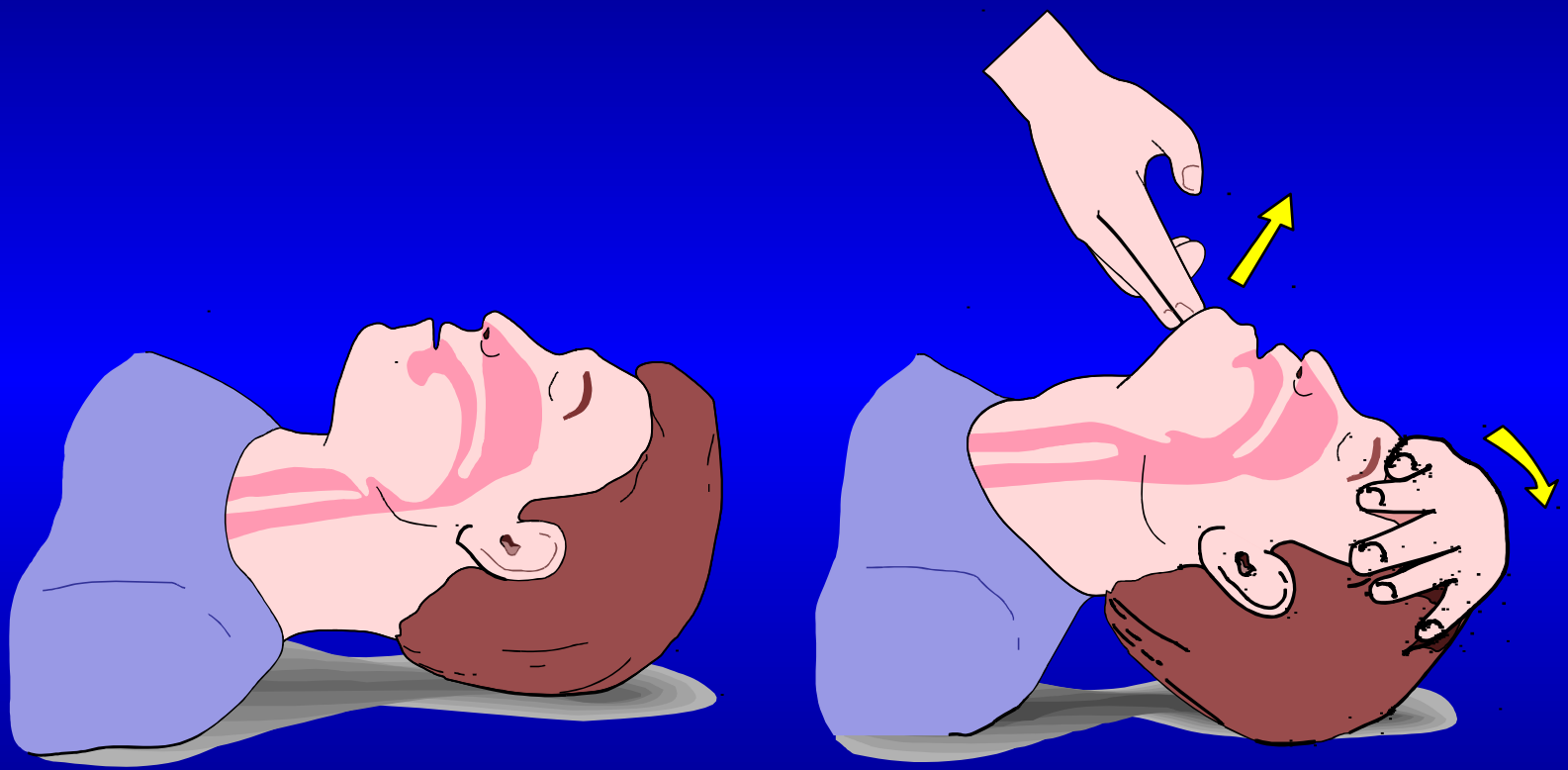
- TONGUE-JAW-LIFT
- OBSERVE AND

PERFORM

FINGER SWEEP

- ATTEMPT VENTILATION

Airway Obstruction and Relief



Tongue-Jaw Lift and Finger Sweep

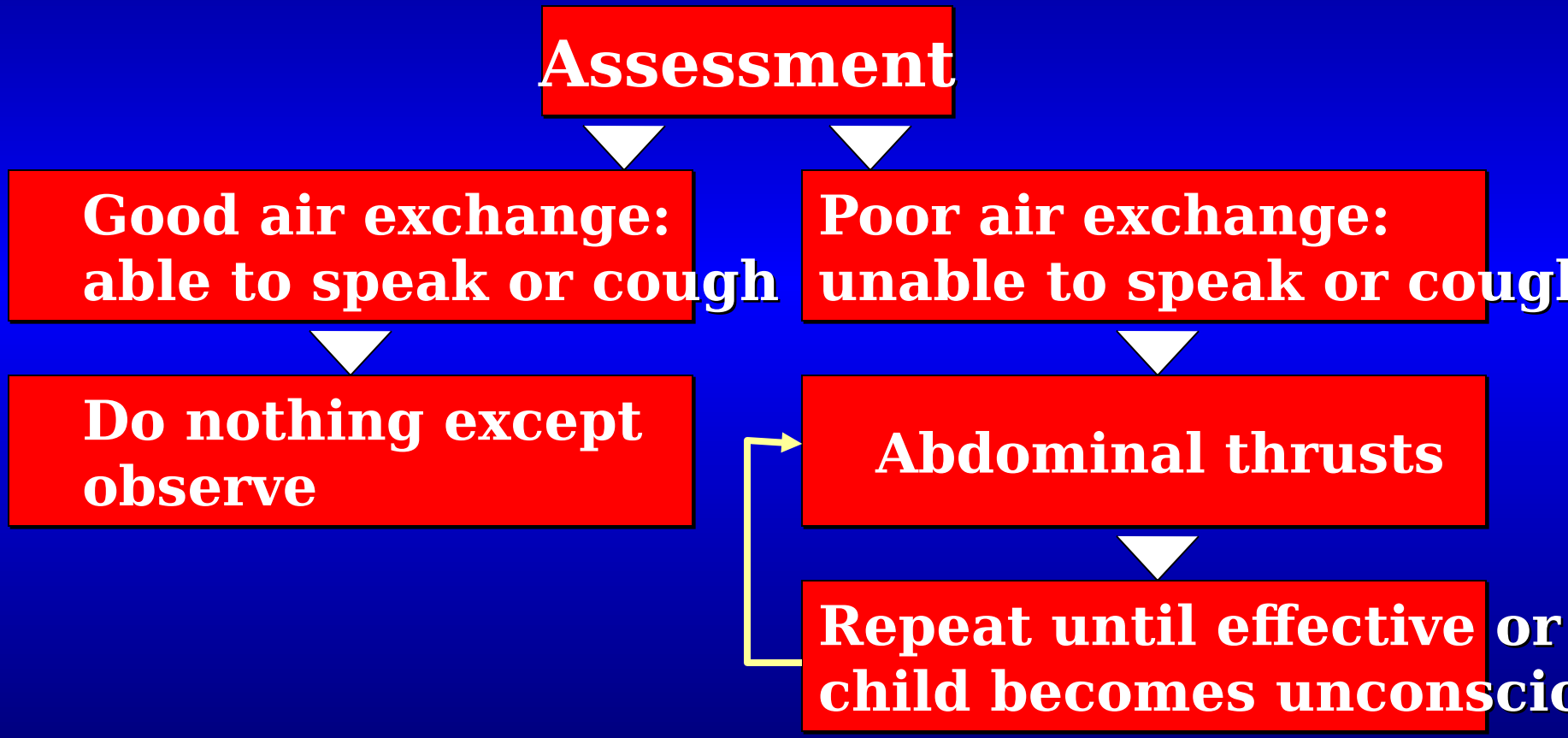
RELIEF OF AN ADULT FBAO

- CONSCIOUS VICTIM
- UNCONSCIOUS VICTIM
- UNCONSCIOUS

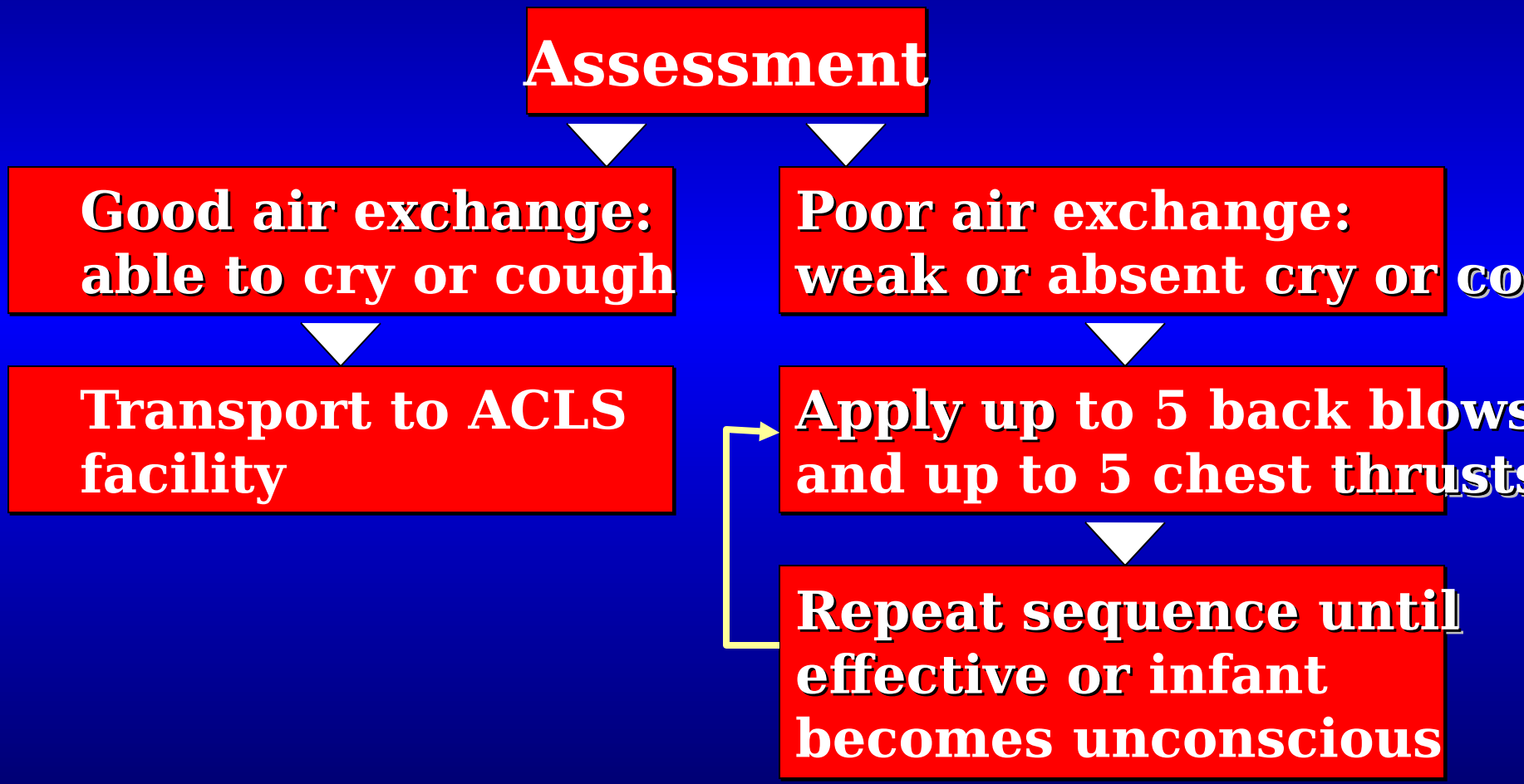
UNKNOWN

VICTIM

FBAO Management
Conscious Child


Assessment
Good air exchange: able to speak or cough
Poor air exchange: unable to speak or cough
Do nothing except observe
Abdominal thrusts
Repeat until effective or child becomes unconscious

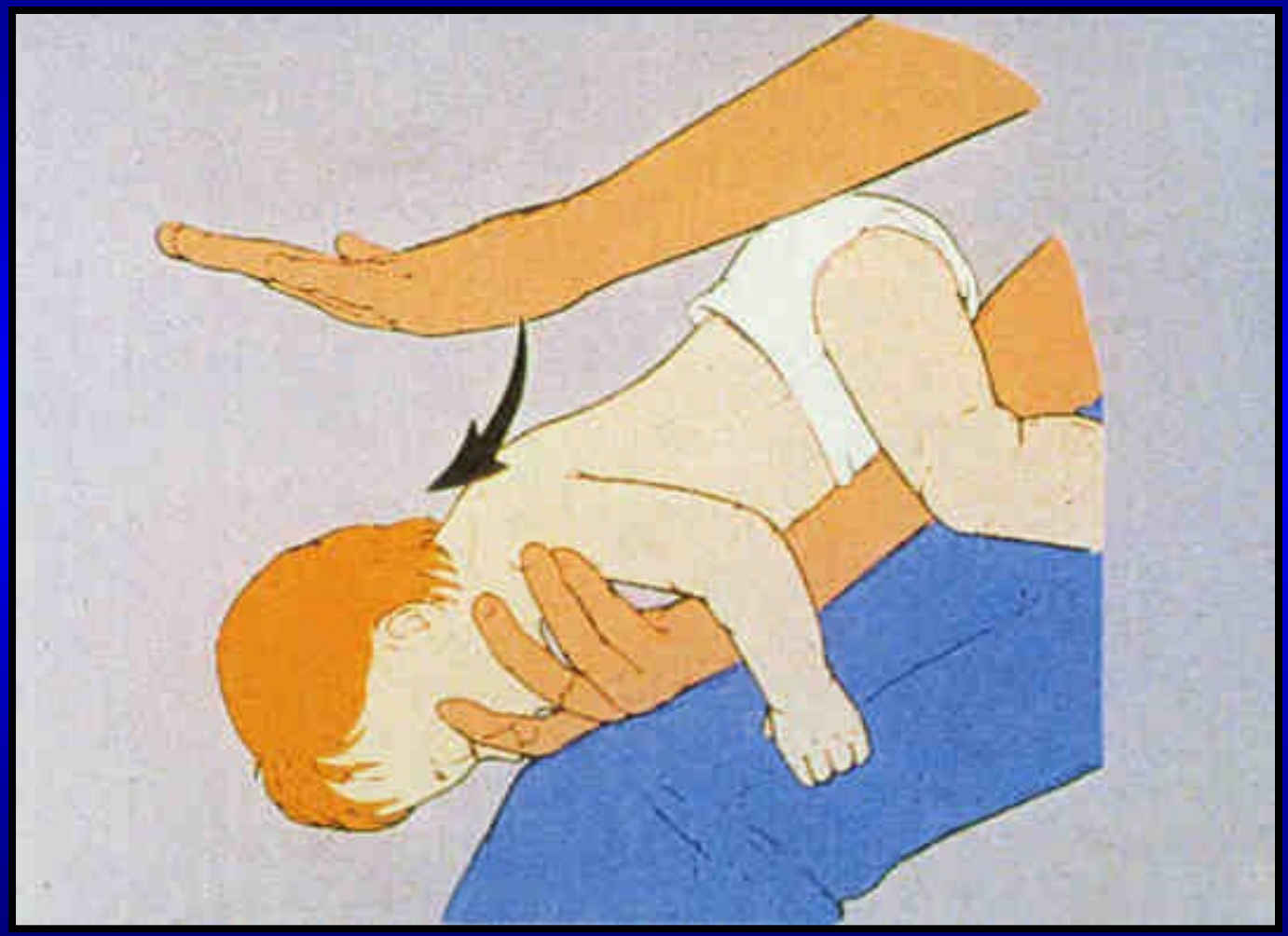
FBAO Management
Conscious Infant


Assessment
Good air exchange: able to cry or cough
Poor air exchange: weak or absent cry or co
Transport to ACLS facility
Apply up to 5 back blows and up to 5 chest thrusts
Repeat sequence until effective or infant becomes unconscious

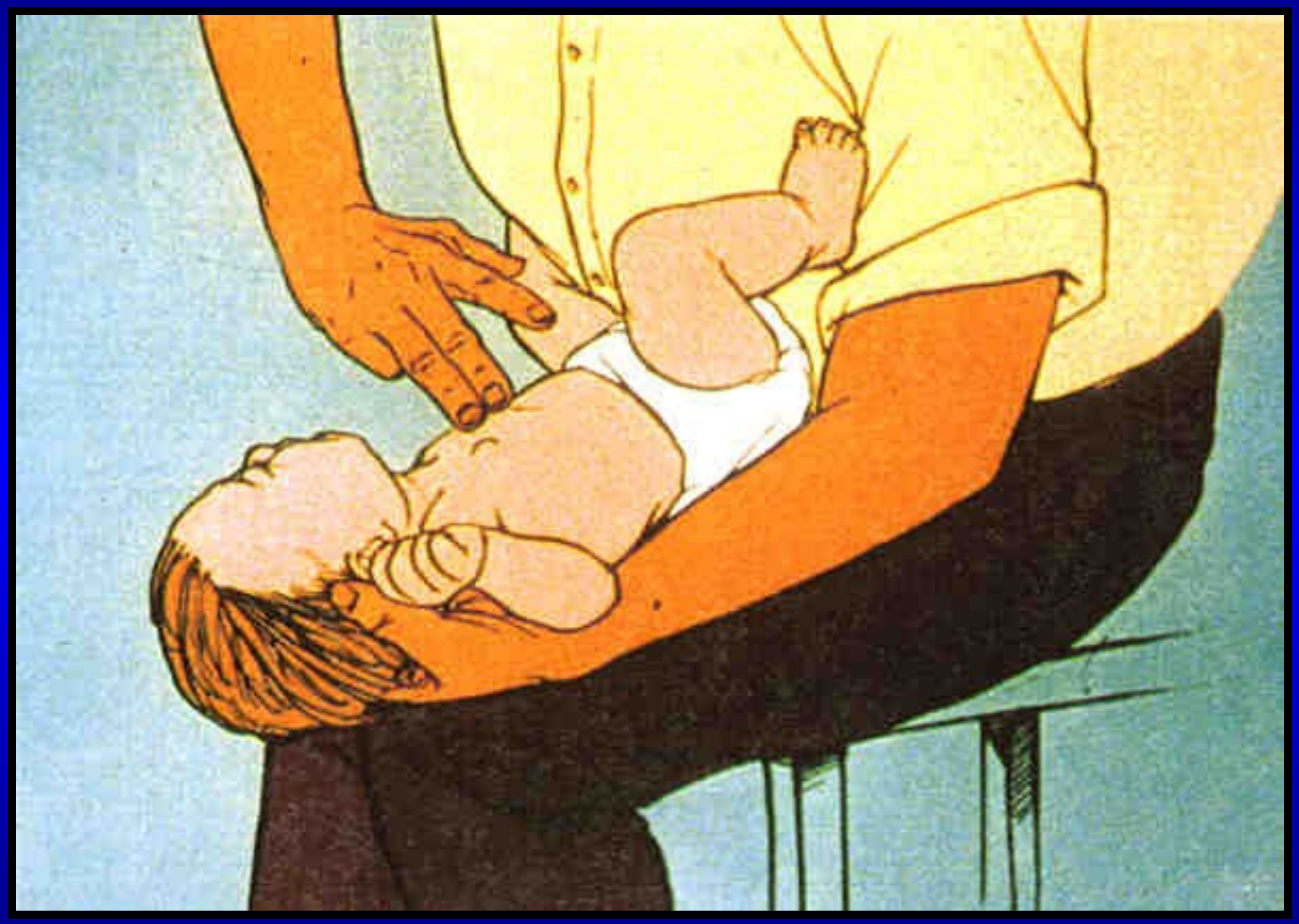
Heimlich Maneuver
Standing Child

Heimlich Maneuver
Astride Child

Back Blows



Chest Thrusts



FINGER LOCATION IS THE SAME AS FOR CPR

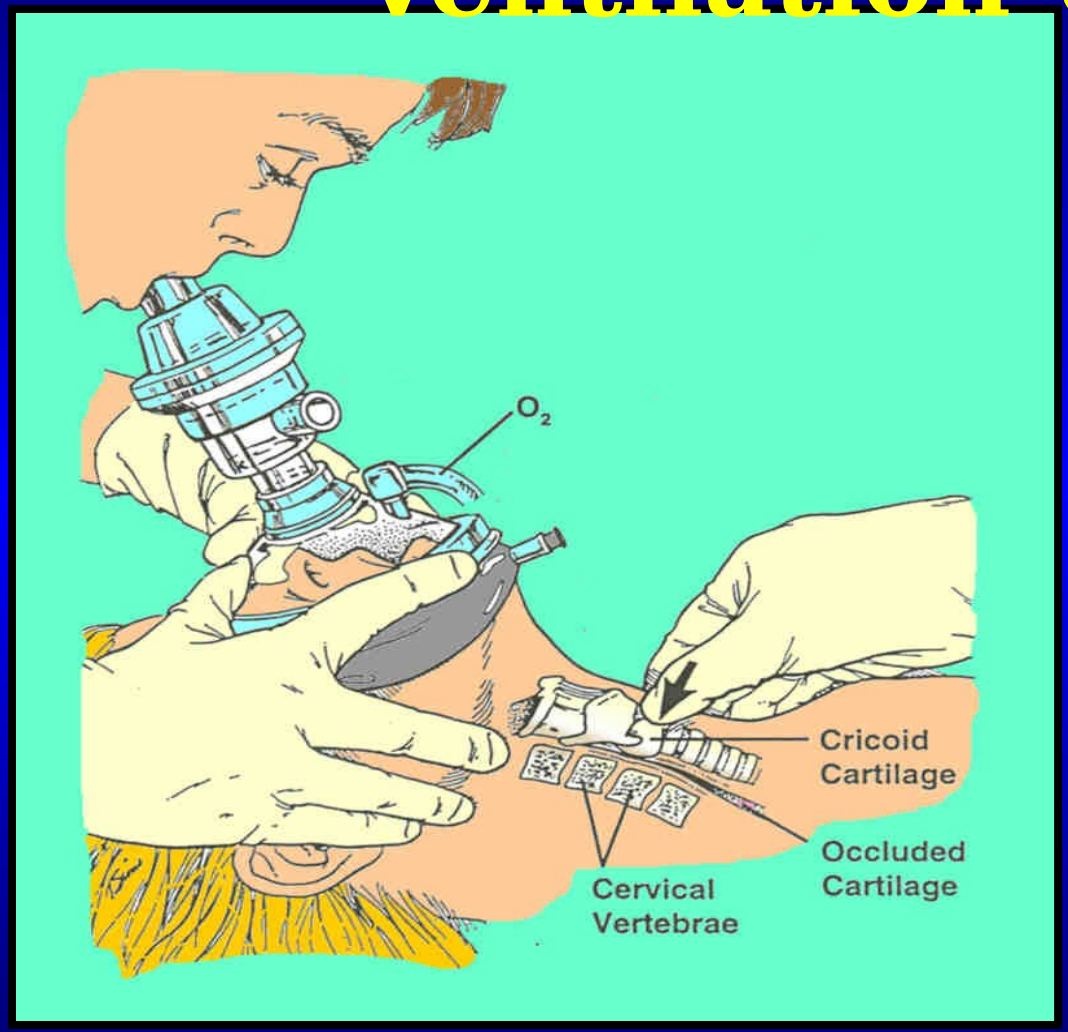
RELIEF OF A CHILD & INFANT FBAO

- CONSCIOUS VICTIM
- UNCONSCIOUS VICTIM
- UNCONSCIOUS

UNKNOWN

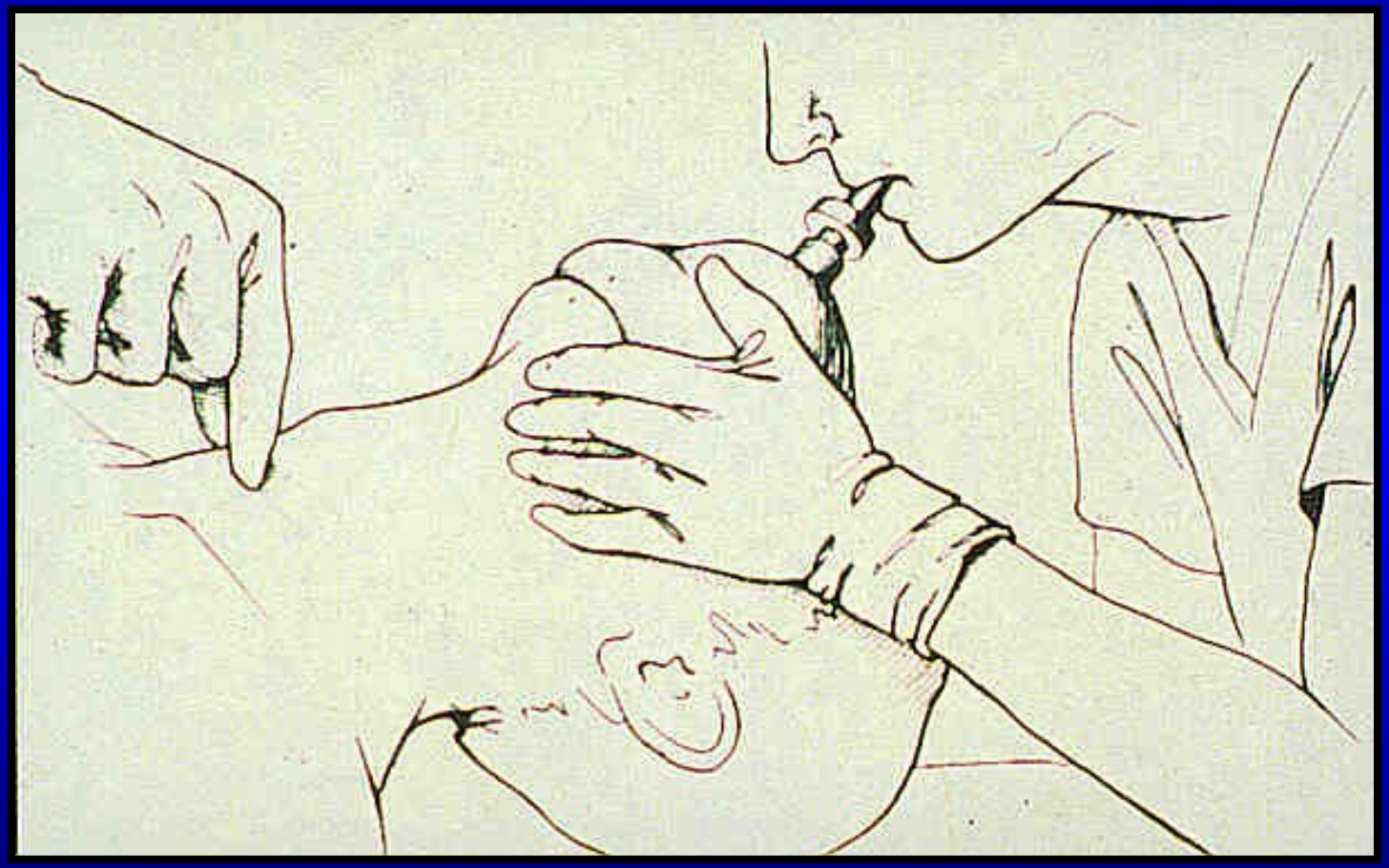
VICTIM

Mouth-to-Mask Ventilation Unit

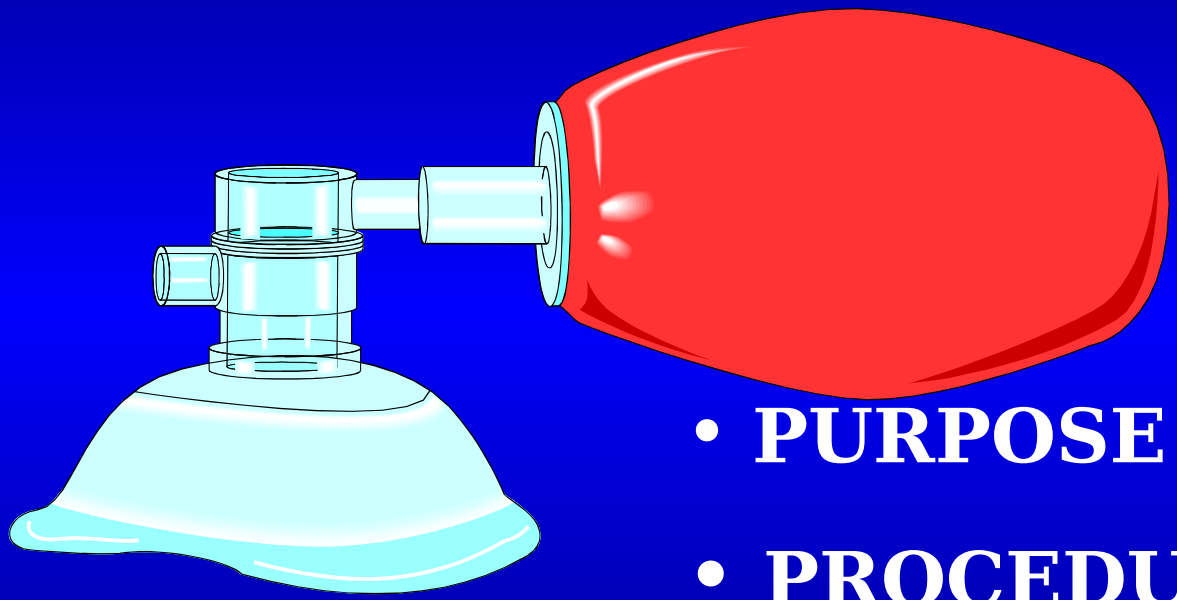


- **PURPOSE**
- **PROCEDURE**
- **DEMONSTRATIO N**

Cricoid Pressure and Mouth-to-Mask



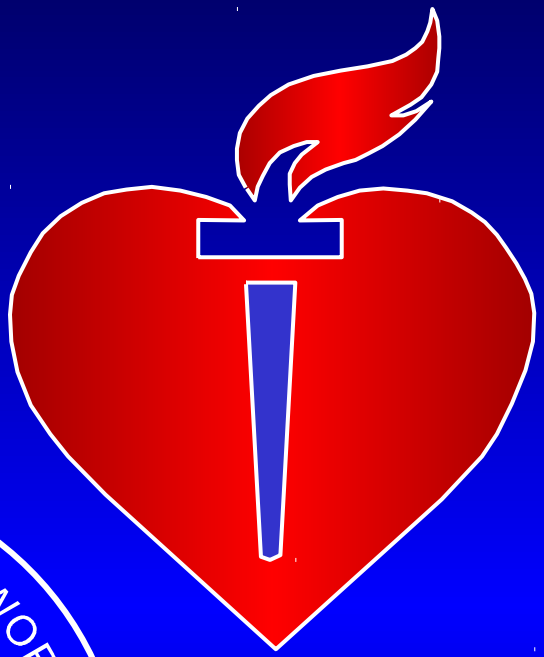
Bag-Valve-Mask-Device



- **PURPOSE**
- **PROCEDURE**
- **DEMONSTRATION**

Automatic External Defibrillator (AED)

DEDICATION
DUTY SERVICE



MILITARY TRAINING NETWORK
CARDIAC & TRAUMA LIFE SUPPORT

Thank You For Attending